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THE OCCURRENCE OF UNDULANT FEVER AND TYPHUS FEVER IN CONNECTICUT*

BY GEORGE BLUMER, M.D.†

IT is not the purpose of this communication to bore you with soporific statistics, but to call your attention to the fact that both undulant and typhus fevers exist in this state, a good many cases probably being overlooked, and to recall to your minds the chief characteristics of these conditions and the difficulties involved in their diagnosis.

UNDULANT FEVER

It has usually been assumed that cases of undulant fever occurring in Connecticut are imported, but the experience of recent years clearly shows that this disease may occur in individuals who have been in the state for years and who, in fact, may have been born here and may never have been out of the state. In the past five years I have seen three cases which originated in New Haven County, one on Dr. Blake's service at the New Haven Hospital, one originating in Branford and sent me by Dr. A. J. Tenney, and one originating in Meriden which I saw through the courtesy of Dr. Thomas Murdock. In addition a case has been reported from Manchester by Dr. Sloan, two cases from Hartford by Drs. Walter R. Steiner and John Lynch, two from Middletown, one of them by Dr. Noland, and Dr. Murdock has had two additional cases in Meriden. This makes in all 10 cases of undulant fever observed in Connecticut during the past four or five years.

Let me recall to you briefly that undulant fever was first satisfactorily described by British Army surgeons stationed on the Island of Malta and that one of them, Bruce, isolated the causative organism, which he called *Micrococus melitensis,* in 1886, and showed the relationship of the disease to infected goat's milk.

Since that time two groups of facts of vital importance have emerged: (1) the recognition of the almost world-wide distribution of the disease, and (2) the discovery by bacteriologists that the organism causing infectious abortion in cattle is closely allied to that causing undulant fever. So far as the United States is concerned, it is known that there are foci of undulant fever in certain parts of Texas and adjacent territory in New Mexico and Arizona, these regions being the centers of the goat raising industry in the United States. It is also to be noted that occasional cases of undulant fever have occurred in nine other states and the District of Columbia, this state and New York being the seats of reported infections in the northeast.

I have spoken of the disease as "undulant fever" because this term is descriptive of its course. It has been commonly known as Malta fever and also as Cyprus, Mediterranean and Gibraltar fever. These local names should be dropped now that we know that the disease is not confined to the Mediterranean basin.

The recognition of the disease is by no means easy in all cases because of the variability of its course. Usually it has an incubation period of about two weeks and during the period of invasion exhaustibility and loss of weight may occur sometimes for weeks before any fever is apparent. In the *common type* of the disease the striking feature is the series of febrile attacks, usually lasting about two weeks and separated by periods of remission of two or more days. The fever usually ranges between F. 103° and F. 104° and is apt to be accompanied by headache, sleeplessness, sweats, constipation and nosebleed. In the later attacks of a series of paroxysms, neuritis, arthritis and occasionally orchitis are seen. As the disease progresses the patient becomes emaciated and prostrated, palpitation may appear, the joint pains become more severe and at the end of the attack the patient may seem prematurely aged. The average duration is four months. In addition to this common type there is a *mild type,* often ambulatory, characterized by a single attack of fever lasting perhaps only two weeks and a *severe type,* with high fever, a typhoid state, delirium, stupor, and death. A type with daily intermittent fever and sweats is also described.

Distinctive signs are absent in many patients. A coated tongue, a tender and palpable spleen, an anemia with a normal leukocyte count and diminished polymorphonuclears may be the only signs. Only two or three per cent. of the patients die.

Undulant fever should be suspected in any patient with an unexplained fever. Most of the cases in this part of the world are mistaken for typhoid fever, but the absence of the skin eruption, the negative Widal reaction and the failure

*Read at the Annual Meeting of the Connecticut State Medical Society, May 24, 1928.

†For record and address of author see "This Week's Issue," page 247.

to isolate B. typhosus from the blood should rule out this condition. In the early stages influenza may be suspected, but time eliminates this disease. In acute rheumatic fever the joint symptoms appear much earlier in the disease and the course is quite different. Subacute pyogenic infections are much more difficult to eliminate and a diagnosis may not be possible on the face of negative blood cultures until embolic signs appear. Acute miliary tuberculosis in the early stages may also cause confusion, but the detection of old foci, the use of the x-ray and the course of the disease will eventually clear up the diagnosis. In this climate, where only the tertian form of malaria occurs, there should be no confusion with this disease. Hidden foci of pus might cause confusion, but the blood picture is entirely different in most patients.

The diagnosis of undulant fever is simple in those patients in whom a blood culture reveals the characteristic organism. Unfortunately it is not at all infrequent to get negative cultures even when the blood is taken at the height of a febrile attack. Errors are sometimes made by not incubating the culture long enough. The organism grows slowly and cultures should be kept seven or eight days before being discarded as negative. Failing a positive blood culture, other laboratory tests must be relied upon, and there seems to be a good deal of divergence of opinion among bacteriologists as to the value of the one most commonly used, namely the agglutination test. The Connecticut State Department of Health is most conservative in the interpretation of their results with the agglutination tests; in fact they are so cautious that one surmises that they are in doubt as to the value of ordinary agglutination tests at all. Certainly a diagnosis should not be made from the agglutination test unless the reaction occurs with high dilutions of blood and there is evidence that many sera from normal individuals will agglutinate B. melitensis in high dilutions if not heated.

It is quite apparent that not all cases of undulant fever result from infection with goat's milk or products made therefrom. So far as I can determine, only one of the cases of undulant fever reported in Connecticut is ascribed to caprine infection. This brings up the question of the source of infection and since it has been shown that Brucella abortus of cattle and hogs is closely allied to Brucella melitensis of goats, the rôle of cow's milk or contact with pigs must be considered. McAlpine and Slanetz state that tests made on the dairy herds of this state show that approximately 90 per cent. of them harbor Brucella abortus. Inasmuch as only about 60 per cent. of the market milk in Connecticut is pasteurized, the opportunities for human infection with Brucella abortus of bovine origin must be very great, so great in fact that we must assume that this organism is not pathogenic to man. This view is substantiated by the work of McAlpine and Slanetz, who have shown that all strains of human Brucella abortus studied by them fall into the porcine group. At least one of the cases reported in this state occurred in a slaughter house worker who was constantly in contact with the carcasses of hogs. Furthermore, as McAlpine and Slanetz have pointed out, there is fairly convincing evidence that cattle also may be infected with Brucella abortus of porcine origin, in which case their milk would presumably be infective to human beings.

So far as undulant fever is concerned, then, we may conclude:—

1. That at least ten cases of the disease have been reported in Connecticut in the past few years.
2. That these cases did not originate from goat's milk.
3. That at least one case definitely originated from contact with the carcasses of hogs.
4. That the probable source of all of them was Brucella abortus of porcine origin.*

TYPHUS FEVER

I have personally observed, during the past 20 years, six cases of typhus fever, all occurring in New Haven but one, a patient of Dr. Max Ruby, of Waterbury. I also have the report of one case originating in Darien, observed by Dr. B. L. Smykowski, of Bridgeport. I cannot believe that these seven patients represent all the typhus fever which has occurred in Connecticut during the period mentioned. In order to encourage its recognition I must recall to your minds certain facts relating to this disease.

The observations on typhus made in recent years make it clear that there are two types of the disease, the one malignant and usually endemic or epidemic, the other benign and almost invariably sporadic. Our knowledge of the latter form we owe to the studies of the late Doctor A. A. Brill, of New York, who first described it in extenso in 1910, after many years of careful study. The merit of pointing out that it is a modified form of typhus rightly belongs, however, to Dr. G. A. Friedman, of New York.

The epidemic form of the disease, which was widely prevalent in eastern Europe and Asia Minor during the Great War, is transmitted by the bite of the body louse or cootie. In the sporadic or Brill type there is usually no evidence of louse transmission and the method of spread is in doubt. It is very rare for more than a single case to occur in a family.

It is Brill's disease which interests us, for there is no doubt that most of the cases seen in Connecticut fall into this category. The condition with which Brill's disease is almost invariably confused is typhoid fever, and for this

*For those particularly interested in the bacteriology of the subject it should be stated that McAlpine and Slanetz differentiated the porcine from the bovine strain by special methods of their own which showed that differences in the metabolism of sugar and the reaction to carbon dioxide sharply separate the two types.

reason perhaps the best way to consider the situation will be to contrast the two conditions.

As a rule Brill's disease begins more suddenly than typhoid fever, although the onset is not infrequently preceded by a prodromal period lasting for three or four days, during which the patient suffers from slight headache with malaise, loss of appetite, and nausea. The actual onset of the Brill's disease is much more likely to be abrupt than is the case with typhoid fever, and the condition is often ushered in by a shaking chill and sometimes by vomiting. The fever rises much more rapidly than is usual in typhoid fever, and from the beginning the symptoms in the nervous system are much more intense than is generally the case in typhoid. The headache is very severe, prostration is pronounced, and the patient is apathetic from the very beginning. The fever reaches its height in two or three days, usually continues for a period of twelve to fourteen days, and is very likely to fall by crisis instead of the lysis which practically always occurs in typhoid fever. The headache, which appears at the onset, is much more persistent than the headache of typhoid fever. All of the patients that I have examined have impressed me on sight as being much more toxic than the ordinary run of typhoid patients at the same period. The suffusion of the conjunctivae, which is very common in Brill's disease, is often a striking feature. The pronounced nervous symptoms, especially the twitching of the muscles, which amounts to subsultus at times, and the stupor and delirium are early features of typhus, whereas they appear much later in typhoid and are generally prominent only in the severer cases. The rash of the two diseases is quite different. The rash of typhus fever is dull red in color, very slightly raised, and does not disappear on pressure. Very frequently it is definitely hemorrhagic, at any rate in part, and in most of the cases that I have seen in Connecticut it has been a much more extensive rash than the rash of typhoid fever. Usually the rash comes out practically all at once and does not appear in crops like the rose spots of typhoid fever. The spleen is frequently enlarged as in typhoid, but the blood picture is somewhat different from that of typhoid fever, as there is generally a leukocyte count which averages about nine to eleven thousand, with about 70% polynuclears and 30% mononuclears. Relapses practically never occur and the prognosis, in contrast to the prognosis of the epidemic type of typhus fever, is almost uniformly favorable. Brill was able to get only one post-mortem in over 200 cases. This discussion of the symptoms indicates the points of differential diagnosis and in doubtful cases the so-called Weil-Felix agglutination test may dispel any doubts.

Since Brill pointed out the frequency of the disease in New York, cases have been reported from Boston, Philadelphia, and Baltimore, and there is no doubt that cases in this state are likely to occur in the larger cities, where they should be looked for, particularly among the Jewish population. All of the patients that I have seen with Brill's type of the disease have been of the Jewish race.

We may therefore draw the following conclusions:

(1) That the sporadic type of typhus fever, frequently spoken of as Brill's disease, certainly occurs in the state of Connecticut, especially among the Jewish population.

(2) That this disease has probably been mistaken for typhoid fever in most instances, but that, if its briefer and more violent course, termination by crisis, hemorrhagic skin eruption, and different blood picture be kept in mind, there should be no difficulty in making a differentiation.

(3) In cases of doubt the so-called Weil-Felix reaction, which consists in the agglutination of Bacillus proteus X 19 by the serum of typhus fever patients, may be employed to confirm the diagnosis.

THROMBOSIS OF PERIPHERAL ARTERIES FOLLOWING THE INTRAVENOUS INJECTION OF TYPHOID VACCINE REPORT OF TWO CASES*

BY ARTHUR W. ALLEN, M.D., F.A.C.S.,† AND REGINALD H. SMITHWICK, M.D.†

DUE to the wide-spread interest shown in the treatment of peripheral vascular diseases with non-specific foreign protein (intravenous Typhoid Vaccine) it is essential that the limitations and the dangers which are associated with this type of therapy should be emphasized.

Before the surgical section of the American Medical Association at Minneapolis in June 1928[1] we reported our results in the treatment of all completed cases to that date giving the method in detail. Up to this time we had complete data on twenty-five cases. We had in addition to these a like number who had had insufficient treatment to warrant reporting, or who were still under treatment with doubtful results. In this whole series over three hundred (300) injections had been used and no dangerous sequelae noted. About fifty of these treatments had been used in twelve arteriosclerotics. A further resumé of our experience in this work, including five additional end results, has been more recently published[2].

*Read before the Roxbury Clinical Record Club, Boston, November 13, 1928.

†For record and address of author see "This Week's Issue," page 247.

In July, 1928, Dr. Leland S. McKittrick called our attention to a thrombosis in the femoral artery of an arteriosclerotic diabetic woman following her sixth non-specific foreign protein treatment for a painful extremity with threatened gangrene. This patient had received 250 million bacilli intravenously at the last treatment. During the pre-chill stage of the reaction, when pre-existing pain is aggravated, the increase of pain was greater than at previous treatments and failed to subside in the normal manner, in spite of the fact that the chill came on and the mouth temperature became elevated in the usual manner. It was obvious later that a thrombosis had occurred in the femoral artery, and a mid-thigh amputation was done. A week later an extremely arteriosclerotic man with tabes dorsalis was admitted to the hospital with gangrene of the second toe of the right foot. He had applied to the Outpatient Department six years ago for pain in the calves of his legs on exertion, the left one being more severe than the right. At this time study revealed tabes dorsalis and considerable relief was given by anti-specific treatment. He was admitted to the hospital on two occasions after this for obstructing duodenal ulcer, and was operated upon first by posterior gastro-enterostomy and later by a partial gastrectomy. Last year he was admitted with a transverse fracture of the left patella which was successfully repaired with fascia lata. He had been free from any disability related to his peripheral circulation until his last admission to the hospital in July, 1928. At that time he was given 75 million mixed typhoid bacilli intravenously. There followed the usual reaction with the exception that the patient experienced an unusual amount of pain in his left leg and foot, which outlasted the pre-chill stage. The left foot and leg remained cold and cyanotic, and the pulsation in the left popliteal artery, which was present before the injection, disappeared. Several hours after the thrombosis, the left popliteal artery was exposed under novocaine anesthesia and a thrombus was removed. The vessel was resutured and the pulsation returned. There followed immediate relief of pain and improvement in the circulation of the foot. Unfortunately, the thrombosis recurred, so that three days later it had extended up to the profunda branch of the femoral artery. The femoral artery was then exposed and the thrombus removed from its entire extent. It again reformed, almost immediately, and a mid-thigh amputation was finally resorted to twelve days after the original thrombosis. This patient was subsequently given six intravenous injections of typhoid vaccine (50 million) and with each he experienced a few days of relief of pain in his gangrenous foot, which could not be obtained by the use of morphine or other drugs. No further thrombosis ensued. Eventually, it became necessary to do a mid-thigh amputation of his right leg for pain.

We are indebted to Dr. Frank Fremont-Smith[3] of Boston for a study of the changes in the peripheral circulation which follow the intravenous injection of typhoid vaccine. A very constant and typical reaction follows such an injection. First, there is a prodromal stage of one-half to two hours during which time the extremities become cooler, pre-existing pain increases, the surface temperature falls, and the rate of blood flow through the capillaries comes almost to a standstill. Next follows the chill, which lasts from a few minutes to one-half an hour. This is followed by a rapid rise in both the body temperature and the surface temperature of the extremities. At the height of the body temperature rise, the blood flow in the peripheral capillaries increases to many times its normal rate and continues for many hours and in some instances for days after the mouth temperature returns to normal. The beneficial results from the treatment are undoubtedly due to the increase in the blood flow through the extremities with the resultant increase in surface temperature.

It is obvious from this study that the first portion of the reaction, namely that in which the rate of blood flow is decreased, represents the time when thrombosis occurs. Dr. Frank Fremont-Smith has found that the period of slowing of the rate of blood flow can be eliminated by applying external heat to the extremities before the injection is given. Thus, he has found that if the extremities are heated to 100-110°F by means of blankets and hot-water bottles or any similar device, this preliminary fall in the rate of blood flow in the peripheral vessels does not occur.

We believe that the danger of thrombosis is greatest in the senile arteriosclerotic cases, and that there is little danger of it in the vasomotor and obliterative diseases of the peripheral vessels in young and middle-aged people. However, the pre-heating of the extremities is a simple matter and probably should be done in all cases before the vaccine is given. This externally applied heat should be maintained until the mouth temperature has reached its peak. After that point, the danger of thrombosis should have passed.

Conclusions:

1. Two cases of thrombosis of peripheral arteries following the intravenous administration of typhoid vaccine are presented.
2. The thrombosis is probably due to a preliminary slowing of the rate of blood flow in peripheral arteries that are already partially occluded.
3. This preliminary slowing of the blood flow may be avoided by preheating the extremities, and the danger of

thrombosis reduced to a minimum.

4. Non-specific foreign protein should not be used in extreme arteriosclerotics unless the possibility of thrombosis is definitely taken into consideration.

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3 Fremont-Smith, Frank: Personal Communication.

SPINAL CORD DECOMPRESSION: INDICATIONS AND RESULTS*

BY BENJAMIN T. BURLEY, M.D.†

FROM perusal of the literature it is evident that the thought of spinal cord decompression has not occurred to neurologists and surgeons as frequently as might have been to the advantage of patients suffering from paraplegia in its early stages. Cerebral decompression, of course, occurs to us at once in cases where there is indication of intracranial pressure, especially where there is difficulty in definitely localizing the etiological factor and where the presence of an increasingly choked disc gives us warning that the patient's vision is being threatened.

It is evident, however, that a considerable variety of diseases may cause compression of the spinal cord to such a degree that permanent paralysis, either of the sphincters or of the muscles involved in locomotion, is likely to be the result unless fairly expeditious relief of a mechanical nature is applied. Usually, of course, this mechanical relief may not be effectively met without laminectomy.

Let us now consider in more detail the type of lesions which may compress the spinal cord.

Compression of the spinal cord may be of acute or subacute origin. The acute type may be due to:

1. *Fracture-dislocation of the vertebrae.* This, of course, pre-supposes a trauma, which may be of direct or indirect origin and may occur at any level of the spinal system. A differential diagnosis in these cases is usually self-evident by the signs of local trauma and the sudden paralysis following. There is, however, one location in which the symptoms may be indistinct or the signs of fracture lacking, namely; dislocation of the atlas on the axis, with or without odontoid fracture. I have seen one or two cases in which this diagnosis was missed and there are several cases reported in the literature where only the subsequent roentgenograms made the diagnosis definite.

2. *Hemorrhage, either extra- or intra-dural, with or without hemotomyelia.* Usually trauma, again, is the cause of this condition and the diagnosis is not difficult, especially after lumbar puncture is done and bloody fluid obtained. Rarely, however, there may be rather extensive hemorrhagic areas in the spinal cord of toxic or bacterial origin, such as the case which I reported before the American Medical Association[1], a few years ago.

3. *Edema of the arachnoid.* This, also, is usually of traumatic origin and unless relieved may well lead to a focal necrosis with extension of the myelitic symptoms.

4. *Abscesses:* (a) *Epidural;* (b) *Intradural.* These, if one may trust the literature, are rare and often obscure in origin. Generally, however, the abscess in the spinal canal may be considered secondary to an abscess either of the neighboring tissues or it is of metastatic origin, probably through the blood stream.

The epidural abscess may be difficult to differentiate from the intradural unless a laminectomy is performed. The lesion, however, if localized, (as is now quite possible with improved diagnostic methods) should be evacuated. On account of the rarity of this condition, I am reporting one case.

Compression of the spinal cord of subacute or chronic course may be due to:

1. *Bony lesions:*

(a) Osteoarthritis, osteitis, spondylosis or myelomata.

These conditions in degree sufficient to cause serious compression are rare, but they may set up an inflammatory process involving the spinal cord or its coverings to such an extent as to require mechanical relief. Usually roentgenograms would be the determining factor in differential diagnosis, but occasionally it will fail to give definite data regarding the bone integrity, as in one of the cases which I shall report.

(b) *Tuberculosis of the bone.*

I shall not discuss this lesion at length except to state that it usually is not difficult of diagnosis at the stage when it causes serious compression. Either the kyphosis or other deformities, roentgenograms, or spinal fluid lymphocytosis readily make the character of the lesion evident.

2. *Tumors.* This also is a subject too extensive for more than brief mention here but none the less very important to diagnose. These tumors may be either intra- or extra-medullary in location. Among the important signs are pain or paraesthesias, although it should be remembered that pain may be entirely absent. When present, however, it is usually well localized and ac-

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†For record and address of author see "This Week's Issue," page 247.

companied by typical sensory and motor changes, often with a belt of hyperaesthesia at the upper portion of the segment affected. Roentgenograms are of little value, but the spinal fluid is likely to contain increased globulin and, more rarely, diagnostic tumor cells.

Laminectomy should be done where there is doubt of the diagnosis as many of these tumors are readily removable. Fortunately, most of these that are extra-medullary lie posteriorly or laterally and are therefore accessible.

3. *Syphilis* must be considered as a cause of compression, particularly if in the form of a gumma. Also a syphilitic meningo-myelitis is capable of causing pressure, for which, again, the roentgenogram gives little diagnostic aid, but the spinal fluid should give typical serological and Wassermann reactions.

4. *Circulatory lesions.* These are rarely extensive enough to produce paraplegia but occasionally, in the form of aneurysms or hemangiomata, must be considered.

5. *Meningeal disease.* Usually this is a diffuse process apt to extend over the cerebral as well as the spinal system and not often likely to give localized pressure. Occasionally, however, as in one of the cases I am reporting, a definite spinal block occurs during the progress of the disease.

6. *Arachnoiditis.* Stookey[2] has reported several cases of adhesive spinal arachnoiditis simulating spinal cord tumor. He had encountered ten cases within three years and had performed a laminectomy on seven of them. He maintained that true cysts of the arachnoid are extremely rare but a tense, adhesive arachnoid containing clear fluid under pressure was usually found upon opening the dura. There being no blood vessels in the arachnoid, the term "arachnoiditis" is really a misnomer, yet it is less clumsy than "circumscribed serous spinal meningitis" or "arachnoiditis adhesive circumscripta." The important point for us is that arachnoid pathology is not as uncommon as supposed. The work of Cushing and Horrax[3] on cerebral cases makes this evident.

Sachs[4] of St. Louis reported thirty-three laminectomies, in eight of which an arachnoiditis was demonstrated. These cases are reported to have made a good recovery.

It is essential, though not always easy, to differentiate all the above lesions causing gradual compression signs affecting the spinal cord and the sclerotic group of spinal cord diseases, especially the not uncommon multiple sclerosis. This latter disease does not cause arachnoidal block and its lesions are usually disseminated enough to cause characteristic symptoms in other parts of the body. Some of the more important of these signs are: nystagmus, pallor of the temporal sides of the optic discs, tremor of intention type, transitory muscular weakness and mental and emotional changes.

When, however, there is evidence of a large dorsal sclerotic plaque, the paraplegia with reflex and sphincter changes may closely simulate compression myelitis.

Without further preamble, let me present three illustrative cases which seemed to require laminectomy.

CASE 1.—Epidural Abscess.

A girl, 12 years old, whom I saw with Dr. Emery on May 23, 1924. Her past history was not significant except that for about a month previous to this time there was an inflammatory condition affecting her right elbow, which was diagnosed as a periostitis.

The present illness had lasted about a week. The day of onset she came home from school complaining of weakness and dull pain in her back. She ran a moderate fever for a few days, had some nausea and vomiting and was regarded as a possible typhoid case. Upon the morning that I saw her, her temperature was 103 and she had developed meningeal symptoms with rigidity of the neck and increased pain and stiffness of the back and legs. There was some impairment of position and vibration sensibility in the legs but no marked impairment of other sensations. Tâche cerebral was present and there was a moderate Kernig sign. The knee jerks were active but there was no ankle clonus or Babinski reflex.

At the patient's home I did a lumbar puncture with a small needle, at the third lumbar interspace, but obtained no spinal fluid. I thereupon sent her to the Memorial Hospital and subsequently did a cisternal puncture and removed 20 cc. of clear spinal fluid.

On the following day the symptoms of pressure in the lumbar region were increasing, causing numbness and weakness of the legs and some disturbance of the sphincters. With the cisternal fluid giving a negative culture and a cell count of only 28, ruling out a generalized meningitis, I decided to investigate the spinal block.

Using a large bore lumbar puncture needle and strong suction with a large metal syringe, I was able to withdraw a small quantity of thick, creamy pus from the spinal canal in the region of the second lumbar vertebra.

Feeling now that we were dealing either with a localized meningitis or secondary abscess formation in the canal, which was likely to cause a destructive myelitis, Dr. Emerson and I decided to do a laminectomy. As soon as the patient was under ether I made lumbar punctures serially with separate needles upward from my original puncture, the upper puncture being just below the 12th dorsal vertebra. This upper area failing to show any evidence of pus, the first and second lumbar vertebral arches were thereupon removed and drainage established.

The organism in this case was staphylococcus aureus.

This patient made a gradual and complete recovery from the spinal symptoms, the temperature reaching normal in fifteen days.

You will note that this case occurred before the use of iodized oil in spinal localization work was established. The serial punctures, however, made a rapid method of determining the limits of the block.

Literature.

Woltman and Adson[5], in 1926, reporting a case of abscess of the spinal cord, reviewed the literature and cited 29 cases occurring between 1830 and 1922. Only two of these cases recovered after operation and one of the two remained

partially paralysed. In Woltman's and Adson's case a laminectomy was performed at the 6th, 7th and 8th dorsal vertebrae and drainage at this point gradually relieved the symptoms of pressure myelitis, which had been slow of development in this case.

The case most nearly corresponding to my own in location and etiological factor is one reported by Taylor and Kennedy[6] before the New York Neurological Society in 1923. In this case a girl of 15 developed rather rapidly loss of power and sensation in both legs with loss of sphincter control and slight rigidity of the neck. Lumbar puncture at the fourth lumbar space failed to obtain any spinal fluid but pure pus escaped from the needle as it was withdrawn. The following day a laminectomy was done at the second, third and fourth lumbar vertebrae, evacuating pus from the epidural space and there was then gradual recovery from sensory and motor impairment. While there was improvement in the bladder sphincter control, the rectal sphincter was still paralyzed when this case was reported. The pus culture revealed staphylococcus aureus.

Late in 1926, Dandy[7] reported three cases of inflammatory involvement, one of which was tubercular and the other two evidently extensions from furuncles of the back.

Dandy in making this report, calls attention to the anatomy of the spinal epidural space and shows that the spinal extradural space is present only dorsal to the spinal nerve attachments. He points out that the epidural fat may assist in walling off the abscess, this preventing a general involvement of the whole extent of the spinal canal. Dandy reviews the first reported infections of the epidural space beginning with Albers[8] in 1833 and ending with his own cases in 1926. His entire series comprises twenty-five cases. Dandy notes that in only four cases subjected to operation was a diagnosis even suspected before necropsy findings.

The most recent addition to the literature on circumscribed suppurations of the spinal cord is furnished by Bennett and Keegan[9] of Omaha, who, in 1928, report a case of a man 32 years old who developed an abscess at the level of the fourth dorsal vertebra, where the lesion was localized by iodized oil and after laminectomy was performed in that region, gradual recovery took place with only minor residual symptoms.

CASE 2.—Spinal Block Complicating Pyogenic Meningitis.

A man 41 years old entered the Worcester City Hospital on July 1st, 1922. Ten days before entrance he began to have pain in his left ear. Not long thereafter he complained of stomach symptoms with epigastric distress. He became feverish and took quinine for this symptom. For the last five days preceding his entrance to the hospital he was about the house except that, during that time, he had a period of unconsciousness which is said to have lasted eighteen hours.

His chief complaint on entering the hospital was of pain in his neck and back.

On physical examination he showed definite signs of meningitis and the spinal fluid, which contained pneumococci, confirmed this diagnosis. Subsequently drainage was maintained by repeated lumbar punctures. On the third day his temperature dropped from 103 to about normal and the general condition of the patient improved.

Subsequently a cisternal puncture was done and it was found that the character of the fluid had improved, the cell count at that time being only 200. For a week thereafter the patient's symptoms continued to improve and his chart looked as if he might actually be making a recovery from a pyogenic meningitis, when, suddenly, he developed pain low down in his back, numbness and weakness of both legs and disturbance of the sphincters.

At this time another lumbar puncture was done and with some difficulty thick, creamy pus was withdrawn from the second lumbar segment. A re-examination of the cisternal fluid at this time showed a clear fluid.

On account of the localization of the meningitis in the lower back, which was causing a complete paralysis below the twelfth dorsal vertebra, I asked Dr. George to do a laminectomy. There followed complete disappearance of the paralysis of both legs and the patient went along three days without a rise in temperature.

On the fourth day, however, a recrudesence of the meningitis occurred apparently in the cerebral region and the patient died on the seventh day following the laminectomy.

CASE 3.—Pressure Myelitis and Arachnoiditis secondary to Endothelial Myeloma.

A woman, 22 years old, single, of Lithuanian parentage, entered The Memorial Hospital June 8th, 1927.

Her family history was not significant and there was no history of important illnesses up to five months ago. Her catamenia began at 15 years of age and had been fairly regular up to last February. There was, however, no catamenia from February until May. Since that time there had been two periods of flowing at three weeks interval. The interne obtained a history of sexual indiscretion in February, since which time there had been marked vaginal discharge resembling leucorrhea.

This gynecological history evidently determined her treatment on the medical service for five weeks, during which time several surgeons and obstetricians saw her in consultation and were impressed with the probability of a four months' pregnancy as the cause of a tumor in the lower abdomen.

In fact, one roentgenogram report three days after entrance read: "Pelvic tumor with shadow within that may be foetal skull".

It developed, however, that there was a rather sudden disappearance of this tumor with a more thorough emptying of the bladder and more attention was then directed toward a weakness and numbness of the legs, which had been increasing during the past three months, concurrently with lack of bladder control. At this time I was asked to see her.

Physical examination: The patient appeared rather pale and sallow. She had evidently lost considerable weight. She preferred to lie with the knees partly flexed. There was at this time no pelvic tumor palpable, but there was a sense of resistance in the region of the abdominal aortic bifurcation. No definite tumor, however, could be made out.

The neurologic signs included a saddle-back area of diminished sensation and trophic atony about the buttock, muscular weakness and subjective numbness of the legs, sphincter weakness and diminished abdominal and plantar reflexes. Position and vibratory sensations were also lost in both legs. Above the waist there were no abnormal signs, the eye reflexes and the optic discs being within normal limits.

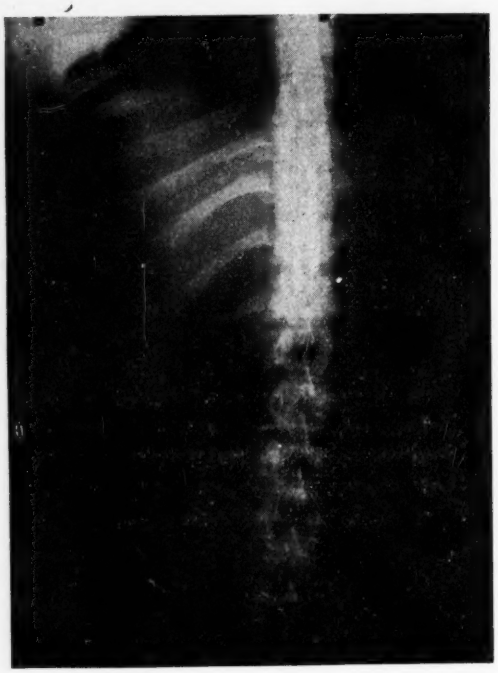
At this consultation my diagnosis was a compres-

sion myelitis, probably secondary to abdominal tumor. I also made a note that the patient was somewhat inferior in intelligence level, but there was no evidence of a psychosis.

The spinal fluid examination made at this time showed a four plus albumen, a four plus globulin and the colloidal gold curve was elevated in the center, but it showed no other pathology, the Wassermann and Kahn being negative.

An attempt was made to clear up the bladder symptoms and to improve the patient's general condition. The patient continued to fail, however, in general strength and her blood condition was deteriorating, (4,050,000 red cells). The area of paralysis was extending upward, this latter fact being proven by our failure to obtain spinal fluid at the second lumbar segment, although I was able to obtain a small amount of fluid by a puncture at the first lumbar segment.

Roentgenograms of the lumbar and sacral verte-



CASE 3, PLATE 1. Roentgenogram showing spinal block localized by lodgment of iodized oil at the eleventh vertebra.

brae at this date failed to disclose any bony lesion, though most of them were taken antero-posteriorly.

At that time I asked the interne to consult with the family regarding an operation procedure, whereupon the patient and her family decided suddenly to go home to be cured by some local physician whom they had heard about.

Three days later the patient appeared upon my service in the Worcester City Hospital, the extensive bladder disturbance and the general weakness of the patient evidently having brought the family to realize it was a hospital case. The paralysis at this time was complete from hips downward to the toes. Tactile, pain and temperature senses were only moderately impaired above the knees but markedly impaired below. The reflexes in the legs were absent as well as the abdominal reflex. Spinal fluid was not obtainable at this time as high as the twelfth dorsal vertebra.

After some persuasion I obtained the patient's consent to do a cisternal iodized oil injection. After withdrawal of one test tube of clear spinal fluid about 2 cc. of warm iodized oil was injected by the cisternal route with good co-öperation on the patient's part with no untoward symptoms of any kind. The patient was held in an upright position for an hour or two following the injection and roentgenograms were subsequently obtained. The iodized oil lodged at the 11th dorsal vertebra.

On August 18, 1927, roentgenogram of the lumbar vertebrae showed some evidence of pathology in the first lumbar body and Dr. Cook reported: "Bone disease of uncertain nature— ? of Legg's disease."

The patient's general condition was very unfavorable for a major operation, but she insisted that unless she had the operation she was intending to be taken to some semi-quack baths of which she had heard, situated somewhere in New York State.

It was therefore decided to do a laminectomy to relieve the arachnoid block. This operation was performed by Dr. Hunt on August 25th under local anesthesia.

Operation: (Surgeon, Dr. E. L. Hunt.) Under local anesthesia of novocain a five inch incision in the dorso-lumbar area was made. The muscles were separated from the attachments to the spinous processes; the arches of the twelfth dorsal and first lumbar vertebrae were removed, it being noted at the time that the laminae were rather soft and friable. More or less plastic material surrounded the cord outside of the dura. The dura at this level was tense and somewhat injected. Upon opening the dura the pia-arachnoid appeared somewhat organized with connective tissue and the spinal fluid seemed to be pent up in this tissue but was dislodged when disturbed by incision or probing. The dural opening was carried upward and then the probe passed upward as far as the tenth dorsal vertebra. Thereupon several droplets of the iodized oil promptly came down through the opening and escaped. The dura was then closed with fine catgut, the soft parts with chromic catgut and the skin sutured without drainage.

A post-operative diagnosis was made of compression myelitis, the apparent cause being an inflammatory deposit in the spinal canal.

The patient's resistance was extremely poor and though she rallied fairly well from the operation, there was a subsequent rather rapid failure to respond to stimulation and the patient died on the following day.

An autopsy was obtained of which a report follows:

AUTOPSY ON CASE 3.

Post mortem examination of the body of a fairly well developed, rather poorly nourished female.

Head: Not opened.

Interior of chest: There is an irregular, whitish growth springing from the fifth rib just beyond the costo-chondral junction and spreading along the rib for 5 cm. The lungs are edematous but otherwise not pathological. Heart and myocardium not pathological.

General peritoneal cavity: This cavity contains some excess of fluid and there is a marked prominence along the lumbo-sacral region pushing forward the root of the mesentery vessels.

The liver is dark in color, of average size and it shows on section slight nutmeg mottling. Gall bladder, pancreas and spleen show no gross pathology. The left kidney is considerably injected and is studded with yellowish white dots (infarcts).

The bladder is greatly thickened with mucosa swollen and injected. Ureters are dilated.

The uterus is small with adnexa not abnormal; os non-parous. The gastro-intestinal tract is normal.

The psoas muscles: both are greatly thickened and together make the prominence simulating a tumor above referred to. On section the muscle substance seems replaced by a grayish, rather tough mass which seems to infiltrate rather than displace the muscle substance.

Vertebrae: There is no displacement of the vertebrae and their appearance is not particularly abnor-

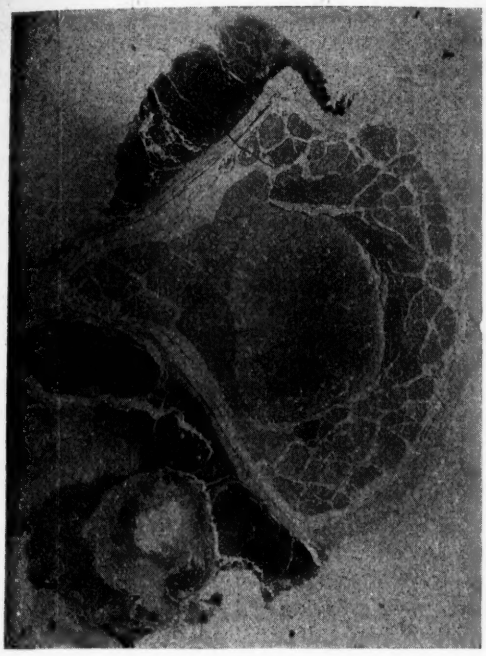


FIG. 1. Sacral segment of cord enclosed in dura with tumor shown in bold masses external to it. Note pressure distortion of the circle. Cresyl-violet stain.

mal until they are incised, when they appear deep red throughout, rather soft in consistency as if much of the calcification were replaced by reddish plastic tissue. This pathological condition exists particularly between the eleventh dorsal and third lumbar vertebrae and in this area between the dura and the bony canal lay a considerable amount of soft reddish friable tissue. The spinal cord in this area appeared rather pale and compressed.

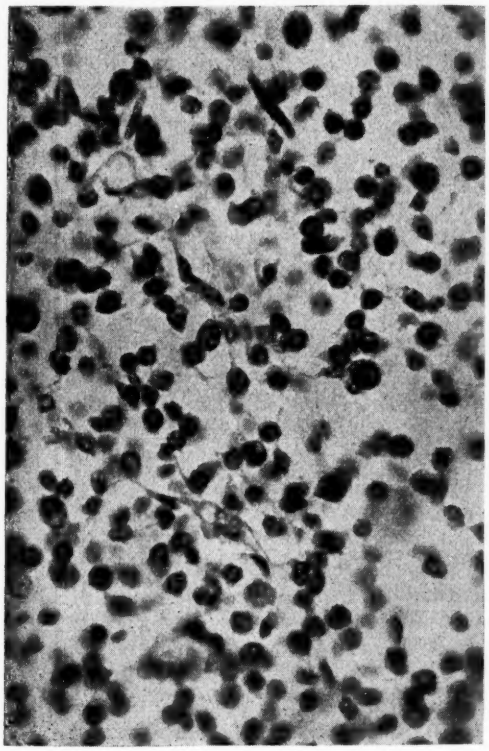


FIG. 2. Detail of tumor, showing stroma. Cresyl-violet stain.

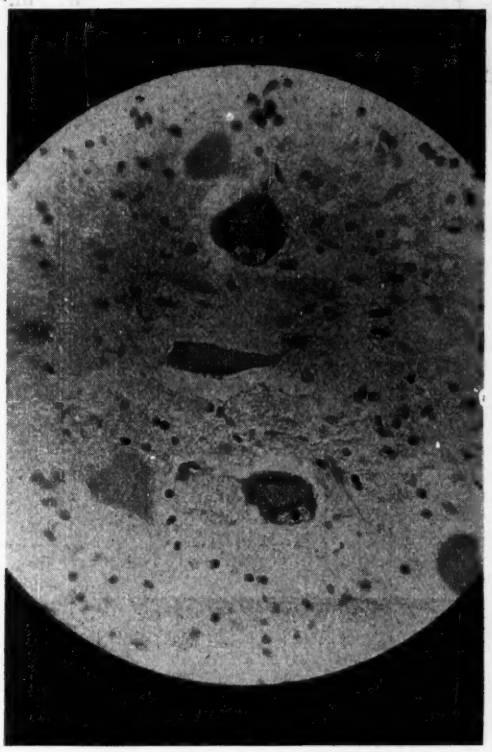


FIG. 3. High power of anterior horn cells showing eccentric nuclei and loss of chromatin granules. Cresyl-violet stain.

Diagnosis: Tumor of the psoas muscles, body of the vertebrae and spinal canal, and one rib.
Compression of the spinal cord.
Pyelonephritis, bilateral with mottled infarcts of left kidney.
Septicaemia, B. Coli Communis.

At my suggestion specimens from the rib, vertebrae, spinal cord and psoas muscle were submitted to Dr. Canavan for further study.

Dr. Canavan reports as follows:

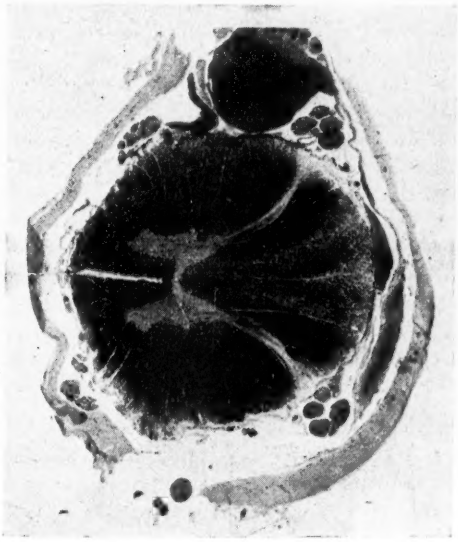


FIG. 4. Section of cord above tumor level showing posterior column degeneration from pressure on posterior roots below. Weigert stain.

GROSS MATERIAL: Two vertebrae with discs attached, stringy muscle and connective tissue adherent to it. 5 cm. of spinal dura mater, tense, containing in the upper part a portion of the lumbar cord; in a lower portion the filum terminale and portion of the cauda equina.

The cross section of the cauda equina shows a different appearance in its posterior and anterior aspect, the former translucent, the latter opaque.

Spinal cord in lumbar region slightly swollen in appearance with dura very snugly fitting it.

The longitudinal section of the vertebrae shows a mottling of darker colored spots in the substance of the bone, which dark areas are darker and softer as their color increases. The lighter areas of the bone are resistant to prodding.

Section of spinal cord shows a rim of dark material around the dura in lumbar region. The next section shows a focalized mass outside the dura of vascular and fairly organized material.

Another specimen containing two portions of segment of the lumbar cord shows gross posterior column china-white change with a slight nip of the same in the region of the right anterior horn white matter. The dura surrounds both and a rim of dark material lines it with a vascular mass by the posterior roots.

MICROSCOPIC MATERIAL: The vertebrae decalcified and stained with hematoxylin and eosin stain show multiple foci of tumor cells staining intensely blue. These cells have little to no stroma and show division of cell nuclei. There are also necrotic foci in the bone with acute polynuclear reaction.

The intervertebral discs show no tumor formation but there are nodules outside of it in the bone.

Vascular masses from side of vertebrae with cresyl-violet stain show both hemorrhagic and necrotic masses and leucocytic reaction with the presence of tumor cells involving the ganglia.

The following microscopic figures were selected to depict the location of the tumor, the character of the cells and the pressure effect upon the spinal cord.

SUMMARY

In my opinion this patient had simultaneous growths in rib and vertebrae known as Ewing's tumor, or endothelioma myeloma of the reticular type- (Connor[10]). This tumor in the vertebrae spread to the tissues surrounding the spinal cord, obstructing the circulation of spinal fluid in the cord and producing stasis both of the spinal fluid and of blood.

Stasis may be responsible for the change of nutrition in the nerve cells in the spinal cord accounting for the myelitis and the clinical paralysis, and due to the position of the pressure, affecting the posterior spinal nerve roots and causing ascending degeneration of the posterior columns as shown by the Weigert section.

The tumor seems to me to be the primary factor in producing a myelitis of the grey matter and a degeneration of the posterior columns of the white matter.

DIAGNOSIS: Ewing's tumor of vertebrae and rib; myelitis of grey matter of the cord; posterior column sclerosis of cord.

The type of tumor present in this case is one which has caused a great deal of controversy among pathologists in recent years but differentiation of it and the other types of myeloma has been greatly enhanced by recent investigators, including Ewing.

The most concise monograph covering this type which has come to my hand was one by Connor in the *Archives of Surgery*. The following extracts are largely from his monograph with a report of 54 cases.

The etiological factor is unknown, but trauma and infection have been proposed as the most likely factors.

Pathology: Tumors are usually situated towards the middle of the shaft of the long bones. They are expansive and bone destroying, pushing the cortex outward with an infiltrating mass. The tumor is soft, very cellular. Metastases are most often found to take place in the skull and lungs. The type of cell is round, oval or elongate with little cytoplasm. The nuclei are round or oval. Mytoses are numerous, but the outstanding feature is the almost constant absence of tumor giant cells or marked pleomorphism.

Location: The favorite location is in the long bones. Of Connor's cases, ten were in the tibia, seven in the humerus, six each in the femur and fibula. Only two involved the vertebrae and ribs. During the course of the disease the tumors become multiple although not to the extent which occurs with multiple myelomata.

Diagnosis: Differential diagnosis must be made with respect to osteogenic sarcoma, chronic inflammation, metastatic tumors and multiple myelomata. The typical osteogenic sarcoma and acute inflammation in bone offer no difficulty, but there are border-line cases in which careful correlation of all signs and symptoms is necessary. While the roentgenogram is the most important single factor in a diagnosis, it is an error to rely solely on its interpretation.

The age incidence is an important aid to diagnosis. Endothelial myeloma is a disease of young people, the average age being 20 years, the exact age of case No. 3. After 40 years of age a bone tumor is usually either a metastatic tumor or a multiple myeloma. The latter tumor often forms multiple nodules in the same bone and is frequently multiple in other bones almost from the outset. It very rarely infiltrates the soft tissues, tending to limit itself to the bone marrow. In this respect it differs from the endothelial myeloma. Furthermore, the urine shows Bence-Jones protein commonly in multiple myeloma and very rarely in the endothelial myeloma.

The differential diagnosis is important because endothelial myeloma is not as hopeless a condition as multiple myeloma, since the former appears to be amenable to treatment by radium and roentgen ray.

The literature that I have found gives only one case of endothelial myeloma primary in the vertebrae. This was a case mentioned by Connor, a child 8 years old with involvement of the

sacral vertebrae, in which partial excision of the tumor established the diagnosis. This case was under treatment by Roentgen ray when reported.

In retrospect on case 3, it is evident that the laminectomy should have been performed earlier, although it must be admitted that a positive diagnosis in this case was almost impossible antemortem. Further, in view of the recent opinion that this particular type of myeloma is amenable to radiation, this treatment should have been applied either before or after the laminectomy.

In conclusion, there is evident need for being mindful of the indications and possibilities of spinal cord decompression as well as cerebral decompression. This is particularly true in acute and subacute cases presenting paraplegic symptoms with sphincter involvement.

With the newer methods of demonstrating subarachnoid block, particularly the Queckenstedt test or the more delicate methods of combined cisternal and lumbar puncture with quantitive spinal fluid analysis, which is Dr. Ayer's important contribution, localization may be fairly definite and unusual conditions such as presented tonight, may be found on exploratory operation.

Grateful acknowledgment is made to my associates in connection with these cases and especially to Dr. M. M. Canavan of the Warren Museum, Harvard Medical School for her efficient pathological work on Case 3.

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ON THE IMPORTANCE OF CLINICO-PHYSIOLOGICAL RESEARCH IN THE DIAGNOSIS AND THERAPY OF CHRONIC RHEUMATISM

BY J. VAN BREEMAN, M.D.*

THE study of chronic rheumatism, as is true of most clinical conceptions, can be approached from various sides. Depending on the viewpoints of the time and the training of the investigator this approach may be more especially from the bacteriologic, anatomical or physiological side of the problem. It goes without saying that whole-hearted co-öperation is extremely desirable in all three directions even though it is seldom that one investigator can devote sufficient attention to all aspects. If in this paper the clinico-physiologic side is stressed, it is not to be supposed that the anatomical and bacterial aspects are not regarded as of importance. Research in bacteriologic fields will undoubtedly adduce important data in the not distant future. However, so much cannot be said of anatomical investigations, which seem within the last twenty five years, to have reached a sort of impasse, though they have afforded valuable data on which physiology can build further. An excellent exposition of this phase of the problem has been given by Prof. Friederick Von Müller, of Munich in his interesting report at the International Medical Congress in London in 1913.

The histological investigations of Prof. Strangeways of Cambridge, who collected and studied four thousand cases of chronic arthritis, have also greatly deepened and enlarged knowledge. His communication that cartilage can grow in the synovial fluid of a living joint is of great value. One of the best anatomical studies respecting arthritis is that of the Americans, Nichols and Richardson, who, after a macroscopic and microscopic study of a great number of cases, distinguished the two well-known types, "proliferative" and "degenerative", also called "atrophic" and "hypertrophic". These types have been already fairly well recognized in German literature.

Some exception to the relative sterility of pure anatomical studies is perhaps afforded by the research of Coates and others, who demonstrated that the nodules found in endocarditis are also to be found in muscles in the paths of the nerves. It is well recognized that many English physicians regard the growing pains of children as a "form fruste" of rheumatism. School physicians have been in a position to observe that growing pains may be followed by endocarditis without other rheumatic symptoms. The pathologic anatomical viewpoint of the French—that various organs often show considerable change as the result of chronic rheumatism—serves to extend the visual horizon.

On turning to the subject of clinico-physiologic research, one is greatly struck by the fact that activities in this connection have been few and slight notwithstanding the thousands of mi-

*For record and address of author see "This Week's Issue," page 247.

nute examinations of joints from the anatomic standpoint in nearly all countries. Investigation can hardly be said to have begun as regards the true nature of the so-called arthritic diathesis, the nature of biological residence and the factors which condition the activity and permeability of synovial membrane.

The writer believes that many stiffened and ankylosed joints would not have been lost to function if certain principles had been kept in mind. Thus, the component parts of which the joints are built are of one origin, viz., the mesoderm. Under certain conditions these tissues are all interchangeable so that in the case of adults, tissues which, after much exercise, have become differentiated into bone and cartilage and synovial membrane may all degenerate again into a fibrous mass. If cartilage, for example, be inadequately used, it changes into fibrous tissue. To keep cartilage in a healthy condition it is necessary to keep it in function, namely, to expose it to special pressures in consequence of the bodily activities. Of equal significance is the anatomical fact that cartilage is without blood vessels and is fed, presumably, by the synovial membrane and by the bone. There are thought to be no lymphatic ducts between the synovial membrane and the capsule and these several facts help to explain some of the clinical phenomena in arthritis deformans.

Notwithstanding generalities of the above nature, the view has gained ground in the past twenty-five years that rational therapy in arthritis is hardly to be expected as the result of anatomical research alone. Research in what might be called functional or dynamic fields, however, in which clinical physiology plays a large part, has given definite indications that a better therapeutic understanding of the disease may be arrived at along this line.

Clinical needs have, in the course of years, produced numbers of schemes of classification and plans of treatment. These have more or less satisfied local instructional requirements but, in view of inadequate precise scientific data, have allowed meagre opportunity for comparison with schemes elaborated in other countries. To consider Germany, France and England alone, clinical teaching in arthritis has there gone through widely different courses of development. At Congress meetings this has resulted in something approaching chaos. Generally speaking it may be said that the French clinical school appears most nearly to approach a rational plan, dividing consideration of the topic of arthritis almost equally into etiology, pathology and clinical evolution.

Subdivisions of the field of arthritis on the basis of anatomical function have only a relative value. Atrophic and hypertrophic types can be distinguished, but cases occur in which the word arthritis is less suited to the conditions present because the inflammatory symptoms are largely missing. In such instances the pathologic anatomic picture hardly ever teaches anything. Zimmer of Berlin points out that the term "inflammatory arthritis" and the conception "infectious" are often unjustly regarded as conceptions which cover each other.

In anatomical preparation one sometimes finds, in a variegated chaos, expressions of pathology which investigators have tried to keep separated by different clinical names. These expressions are bound up with the duration of the process, the power of reaction of the organism, with the causal factors, and with various static relations. Sometimes with the same cause widely divergent pathologic-anatomical deviations are found. Conversely, with different causes a common anatomical picture may be found. This is because the organism is not a dead element but even in its chronic morbid conditions brings about numerous anatomical alterations by its powers of reaction. Be it casually observed here that the x-ray picture, however valuable, is nothing but an anatomical preparation generally shedding but little light on pathogenesis. In any case it is certainly rarely permissible to draw conclusions about function from radiographs.

The attitude of hopelessness bound up with the term "arthritis deformans", a term originally applied only to carefully dissected preparations, constitutes at present one reason for the negative therapeutic attitude of many medical men towards rheumatism. To-day it frequently occurs that the diagnosis of arthritis deformans is made, not after autopsy or after examination of x-ray photographs, but on the mere detection of crepitation of a joint.

The purely anatomical viewpoint has long been in the limelight, especially in Germany and Holland, and has for a long time prevented the development of an adequate conception of the possibilities of functional therapy in chronic rheumatism. Functional therapy depends, in the main, on physical therapy, and Dr. Schober rightly remarks, "Wenn die Balneologie als Wissenschaft lange Zeit hinter der uebrigen Medizin zuruckgeblieben ist, so ruehrt dies eben grossen Teils von jener pathologisch-anatomischen Einstellung in Aerztlichen Denken her". With the inauguration of a more systematic campaign against rheumatism, it becomes significant to determine the state of affairs at the moment, and to ascertain what may be expected in the way of diagnosis and therapy. To this end, a rough review may be here subjoined.

After years of comparative study of German, English, French and American literature the following may be summarized as the total impression:

1. That the German schemes, which are principally anatomically orientated, contain valuable scientific data, partly suitable for international comparison. Causal factors, however, do not get their fair share, most of all in the study of the

orthopaedists (function disturbances through static etc. etc.)

2. That the French schemes are usually rational in conception and contain valuable clinical data, in which pathogenesis also frequently gets its share. For comparative international study there are relatively few points of contact.

3. That the conceptions of the English are mainly clinically orientated. The English medical school in respect to rheumatism reflects an old cult, in which the causal factors come into the foreground along different paths than those of the French. Here, too, international comparison often meets with difficulties.

In the medical handbooks of the English the great cultural development of English men is but partly done justice to, because they often write therein according to German conceptions.

4. That American medical men (orthopaedists and internists) have done important research work of late years and have furnished data accentuating especially pathogenesis. Where focal infection is not exclusively designated as the only cause, these studies are very important from an international point of view.

In the past it has appeared that in a variety of morbid clinical conditions, especially of chronic nature, we have entertained too simple an idea of "causes". For the most part various factors are operative in a causal sense. Even in more acute infections, such as "catching colds", it appears that not only the bacteriologic but also the metereologic and constitutional factors play a part.

In chronic rheumatism, this ought to be kept in mind in order to avoid the establishment of incorrect ideas of etiology.

It is not principally the diagnosis (the label we paste on the illness) but the pathogenesis (in which different factors may operate) which gives us a better understanding of causal relations and also to a great extent determines our therapeutic standpoint.

After many years of study of international literature, it appears that in the diagnosis and therapy of chronic rheumatism, four factors always emerge in varying importance. The International Committee on Rheumatism has made these four principal factors the objects of a more systematic investigative research. These main factors are:

1. Focal Infection.
2. Constitutional anomaly (arthritic diathesis).
3. Abnormalities in the circulation.
4. External factors (social, cosmic, etc.)

The proposals to designate a new classification and new nomenclature for international use are premature. Every nomenclature and every "schema" bears the signs of its age and derivations, at the same time clearly demonstrating our lack of knowledge. Only after more complete information, the result of research, would a consideration of further classifications be appropriate.

Each of the four factors mentioned above contains subdivisions already ripe for investigation. It is highly desirable to establish a simple nomenclature for statistical data of social significance for use in all countries. To this end it would be well if all countries could take over the simple and practical scheme to be found in the English Government report. Fortunately various countries represented in the International Committee on Rheumatism have expressed their willingness to do this.

In the period now behind us the surgeon has, by chance, been the man to whom all types of chronic rheumatic arthritis have been referred. Because of his anatomical conception of the illness he has emphasized the importance of the diseased joint. The x-ray has also tended to narrow the conception of rheumatic conditions to gross morbid pathology, pure and simple. However, the diseased joint (arthritis) is but a symptom or expression of a general morbid state which has been treated in a stepmotherly fashion by orthopaedists but belongs to the domain of the internist. The surgeons and orthopaedists are of great importance in the capacity of consultants and it can be said that in most countries they have done more for the study of rheumatism than have internists as a group. The following case history illustrates this situation.

A woman of 48 suffered for some years with a trouble in her left knee. She was referred by her family physician to a surgeon, who diagnosed, on the basis of clinical x-ray examinations, arthritis deformans of the left knee. The left knee was markedly involved, but the x-ray showed only a few slight abnormalities. The arthritis itself was characterized principally by infiltration of the synovial membrane, which caused crepitation on movement, both palpable and audible. On close examination, however, the right knee, about which the patient did not complain, also proved badly infiltrated and crepitated likewise. The general condition as a whole was representative of what some English clinicians call "fibrositis", a great part of the synovial membranes, muscles and subcutaneous connective tissue being markedly infiltrated. This condition is one often found in women at the menopause. Under these circumstances local treatment assumed a different significance, the principal indication being for electric light baths, a "hunger" diet and thyroid treatment, with a local hot air bath of the knee.

One of the advantages to be gained by research in chronic rheumatism and the maintenance of a wide-angled viewpoint is that it compels us to see abnormalities in the joints as "only one branch of a very large pathologic tree constituting merely the expression on the surface of an underlying pathology (Pemberton).

It is the intention of the International Com-

mittee to induce all countries to improve and make uniform their own nomenclature as soon as possible so as to minimize difficulties arising from this source at international conferences. The nomenclature and plan for statistical research recommended by the English Ministry of Health has much to recommend it and is already accepted in many countries.

Some comment can be made on the four main factors above referred to.

(1) *Focal Infection:* The importance of this is variously estimated in different countries. Whereas the great majority of medical men writing in English accept the significance of focal infection, there are numbers of medical men on the continent who assess the importance of this factor as being very low. The views expressed by Pemberton and Schotmüller offer some opportunity for comparison. Dr. Pemberton is one of those in America who warn against the exaggerated value attached to focal infection. In one of his articles, however, he commences with the words "it is generally accepted that focal and other infections are the cause of many cases of arthritis".

Contrast this with the attitude of Prof. Schotmüller, who, chiefly on the ground of theoretical considerations, denies the connection between infection of the teeth and chronic rheumatism. (Deutsch. Med. Wchnschr., 9, February 1922).

Scientifically, the connection, from the laboratory standpoint, between focal infection and chronic rheumatism has no sound foundation as yet. Dr. Pemberton's research on the close communion between the intestinal contents and joint fluid is of great significance in this regard. He showed that between the intestinal tract and the joint fluid there is a hitherto unsuspected close relationship. Glucose taken through the mouth is demonstrable in the joint fluid after a very short time and this is also often true apparently of other substances. It has been demonstrated that in this way joint cartilage, which is largely without blood vessels, gets much of its nutrition; and at the same time the way is open for admission into joints of a number of possibly deleterious substances from the intestinal tract. The conceptions of some English authorities on rheumatism as to the connection between chronic rheumatism and intestinal diseases thus appear in a new light.

(2) *Arthritic Diathesis:* If this constitutional anomaly is viewed from the clinico-physiological angle, one is struck by the deficiency of the autonomic nervous system as compared with the expression of the will center. Upon drawing a series of fatigue curves, it is to be observed that the persons with a normal constitution increase in performance each succeeding day, while those with a pronounced arthritic diathesis do not increase in achievement but often show palpable disabilities after some days. Those persons who in daily life frequently strain themselves by such minor efforts as uncorking bottles, turning a door knob, etc., are nearly always people with the "rheumatic diathesis". Klinkert and others have demonstrated that eosinophilia up to ten and twelve per cent. is fairly regularly met with in pronounced cases.

According to various English investigators there exists a "mild chronic acidosis which extracts lime salts from the fibrous tissue, muscles, nerves, cartilages and bones". This old-fashioned English point of view is somewhat supported by more modern American research. The conceptions of the French school lay emphasis on hereditary and family predisposition and there are American writers who attach importance to a sedentary occupation and superabundance of diet as predisposing towards arthritic symptoms. How far irregularities in the endocrine functions are to be incriminated directly or indirectly in the arthritic diathesis is a question which is to be decided.

(3) *Abnormalities in the Circulation:* Study of irregularities in the circulation of the skin in chronic rheumatism may contribute conceivably to a better knowledge of chronic rheumatism. The statement of many patients with chronic rheumatism that they feel cold in general, or only in the affected part, may be checked by objective observations with sensitive skin thermometers. When a number of normal persons and rheumatic patients are left stripped naked in a moist cold room, it appears that the power of reaction of the rheumatic patient in maintaining his temperature in these circumstances is generally much lower.

It repeatedly happens that rheumatic patients complain of feeling cold in the affected part and on examination this region is sometimes characterized by a distinct fall in the circulation and temperature, though not invariably. This general defective reaction on the part of the skin circulation may be considered as a symptom in many cases of the arthritic syndrome; and also partly as a causal factor under which circumstances it may play a part in a vicious cycle.

(4) *External Factors:* Observations extending over centuries show, in general, that a dry and warm climate affords lesser opportunity for rheumatic affections to arise; and that if they already exist, there is a good prospect of considerable improvement. This general impression has been corroborated recently by newer observations; thus, Lavison for example, could not discover a single instance of advanced rheumatic disability during twenty years of praetice on the island of Martinique, while acute arthritis of the joints, if it appeared at all, did so to a mild degree ending favorably.

Another indirect but important influence of climate is, of course, to be seen in the usual respiratory infections such as the common cold, which may create a temporary or permanent focus of infection. Apart from the influence of climate a distinct etiologic rôle may be played by occupations in which persons are exposed to

marked fluctuations of cold, heat and moisture.

Of no less importance, however, as regards occupation is the over-use of certain joints and muscles so that it is sometimes possible for the physician to deduce from the site of the lesions the occupation of the sufferer.

The problem of partial invalidity is important in that numbers of subjects of chronic rheumatism are rejected on applying for work or are thrown out of work, although in many instances the general health may be quite good in those cases where the disease has become arrested. It is obvious that better care of these cases at an early stage of the disease would avoid much of this partial disability and that the end result to the community would be of great significance.

For some years there has been in England and America a strong tendency to stress the bacteriologic and surgical factors in the etiology of rheumatic disease at large, so much so that other factors of importance have been temporarily pushed into the background.

It is the belief of the writer that if the Americans and English would lay less stress upon focal infections as the chief cause of arthritis and would pay more attention to the views of other schools, such as the Dutch and German, a broader angle of vision would be maintained and opportunity would be removed for the criticism, from the Continental viewpoint, of the existence elsewhere of a single-minded attitude towards this great subject.

SURGICAL ASPECTS OF A FEW TROPICAL DISEASES*

BY GEORGE C. SHATTUCK, M.D.†

MY purpose is to call to mind a number of tropical maladies which, at times, present phases of interest to the surgeon. If he is to diagnose them correctly, he must be on the watch for tropical diseases. In some respects the subject has been dealt with more fully by Madden.‡

FILARIASIS

Knowledge of the natural history of the various kinds of filariasis has made great strides, but there is, as yet, no drug known to cure them.

Filaria bancrofti. This filaria is found in practically all parts of the tropics, and also in Southern Spain and in Charleston, S. C. The adult lives in the lymphatic vessels or glands and the microfilaria, the embryo, circulates in the blood. The embryo shows a nocturnal periodicity except in certain Pacific islands where it is not periodic.

The belief is gaining ground that neither the presence of the adult worm nor of the embryos causes recognizable lesions or symptoms, but that subjects of filariasis are abnormally susceptible to inflammatory processes which are attributable directly to pyogenic bacteria and indirectly to the parasite. Thus, associated with this form of filariasis one commonly sees erysipelatoid or lymphangitic attacks which may lead to abscess formation or to elephantiasis, and there may be acute or chronic adenitis or transient inflammation of the testicle.

Treatment should be directed, firstly, against the existing pyogenic infection; secondly, against recurrence of infection; and thirdly, toward relief of symptoms caused by residual lesions such as chronic adenitis, extensive lymphatic obstruction with or without chyluria, and elephantiasis.

Although death may occur from septicemia, and an abscess must be drained, the acute inflammatory process, as a rule, subsides under rest in bed.

Injections of polyvalent *Streptococcus* vaccines, or of mixed vaccines of streptococci and of *Staphylococcus pyogenes aureus* have seemed to be serviceable, in a large proportion of cases, by limiting or preventing the recurrences of inflammation when such recurrences had been frequent before the use of the vaccine.[1]

Most of you, probably, have seen a case in which extirpation of a mass of chronically inflamed glands has been followed by the development of elephantiasis, or a case of elephantiasis which seems to have been aggravated by this procedure.[2]

Treatment of elephantiasis of a leg should take into account the following facts:

1. The lesions of elephantiasis of tropical origin in which the filaria has probably played an indirect part are essentially the same as those of sporadic cases occurring in regions where there is no filaria of man.[3] The term *false* or *pseudo*-elephantiasis is, therefore, a misnomer.
2. The essential lesions are lymphangiectasis, hyperplasia of connective tissue, and chronic edema.
3. The many predisposing causes of non-filarial elephantiasis include adenitis, trauma to a limb, chronic inflammation or tumor in the pelvis, and phlebitis, varicose veins or heart disease when they produce persistent edema.
4. Roughening or cracking of the skin over the lesion or trichophytosis between the toes are likely to serve as portals of entry for bacterial infection.

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‡Practice of Medicine in the Tropics: Byam and Archibald, 1923, Vol. III, p. 2499.

5. Before performing an extensive operation it would seem desirable (a) to keep the patient in bed with the affected part elevated in such a way as to promote absorption of the edema; and (b) to improve the condition of the skin in every possible way if it be rough and dirty.

Elevation of the leg leads to copious diuresis for a few days and to marked shrinkage of the limb. Subsidence of edema continues more slowly for several days thereafter. It can be hastened by tightly bandaging the affected member.

When the edema has subsided, it is easier to decide how much redundant tissue to remove, healing will be facilitated by improved circulation, and the danger of infection will be reduced.

6. No kind of treatment cures elephantiasis. The choice lies between non-interference, persistent use of mechanical support to control edema, or operation.

The relief afforded by removal of large scrotal tumors is very gratifying to all concerned, but cases of elephantiasis of the leg generally relapse unless operation is followed by mechanical support, intelligently and persistently applied. Probably, there are a few exceptions to this rule.

The *Guinea-worm, Dracunculus medinensis,* is another species of filaria which may lead indirectly to bacterial inflammation or abscess formation. Although it is very prevalent on the West Coast of Africa and is found in other localities, I have not heard of a case being seen, as yet, in this country.

Loa loa, formerly called *Filaria loa,* or *Filaria diurna,* is of special interest to ophthalmic surgeons because the adult, in its migrations, is prone to invade the eye, whence it may be extracted with comparative ease.

AMOEBIASIS

It is believed now that amoebae of pathogenic type infest many individuals, not only in the tropics but also in this country, in England, and perhaps throughout the world. That occasional cases of amoebic dysentery may develop as far north as Nova Scotia has long been known. Therefore, in obscure cases of colitis, hepatitis, liver abscess or lung abscess of subdiaphragmatic origin, the possibility should be borne in mind that the amoeba may be at the bottom of the trouble, even if the patient has never visited the tropics.

We have several drugs which are of great service in the treatment of amoebiasis, but a large abscess of the liver may, nevertheless, require drainage by aspiration or by operation.

Madden* deals at length with liver abscess.

*Loc. cit.

ULCERATIVE DISEASES

Leprosy should not be forgotten; the phagedenic or "*tropical ulcer*" may be met with; and the tertiary, ulcerative lesions of *yaws* may be diagnosed as syphilis and successfully treated as such.

It is important to recognize the *external leishmanioses,* such as Oriental sore or Aleppo boil of the Near East, and also the Egyptian and the Brazilian varieties. The leishmanioses are resistant to most forms of treatment but generally yield to intravenous injections of antimonials. Oriental sore has been successfully treated by the application of carbon dioxide snow.

Granuloma inguinale has long been known in the tropics under the name of "ulcerating granuloma of the pudena." (This name is obsolete.) Within recent years, a number of indigenous cases have been reported from several of our large cities. Although more common in the Southern States, it now appears that the disease is likely to be met with, particularly among negroes, in any large genito-urinary clinic in this country. Granuloma inguinale is often diagnosed and treated as syphilis for long periods without benefit. Operative measures, such as curetting or excision, regularly fail, but there is one remedy, and only one that I know of, which nearly always succeeds in these cases if properly applied. It is the intravenous use of antimonials.

Schistosomiasis, or *Bilharziosis,* is caused by one of three closely allied flukes. *Schistosoma haematobium* is common in parts of Africa and of Arabia. It causes hematuria and pain in the bladder which may be too slight to attract attention. On the other hand those who have been subjected for many years to repeated invasions by the parasite may suffer severely. There may be mutilation of the penis, cystitis with or without bladder stone, stenosis of the ureter and hydro- or pyo-nephrosis, and sometimes large stones in the kidney.

Schistosoma mansoni is abundant in parts of Africa, and occurs locally in South America, and in the West Indies. It may produce rectal adenomata, symptoms like piles or dysentery, or cirrhosis of the liver and enormous splenic enlargement.

Schistosoma japonicum is locally distributed in China, Japan, and the Philippines. The lesions which it produces are analogous to those of *S. mansoni.*

Imported cases of infestation with *S. haematobium* are not infrequently seen in the United States but those of *S. mansoni* are rarer here. Probably *S. japonicum* is not uncommon among Orientals on the Pacific Coast.

These three flukes can be killed and their activity ended by intravenous use of antimonials. Every patient who passes ova of one of them should first be treated medically. The

residual lesions may demand surgical measures later.

SPLENOMEGALY

From time to time surgeons are called upon to remove very large spleens, that is to say, spleens extending to the umbilicus or even down into the right lower quadrant. Such greatly enlarged spleens are common in certain tropical regions and may be found occasionally in almost any tropical country or in temperate regions. It seems to me that there is reason to doubt whether uncomplicated malaria can give rise to these enormous spleens. Difficulty of diagnosis arises from the fact that, in localities where these enormous spleens are most often found, malaria is prevalent also.

A type of greatly enlarged tropical spleen known as "Egyptian splenomegaly" has been mentioned under schistosomiasis. This type is very common in Egypt, in the vicinity of Lake Nyasa, and in parts of China and Japan, and is generally conceded to be caused by schistosomiasis.

A second group of large spleens is supposed to be of mycotic origin[4]. "*Histoplasma*[5]" and "*Cryptococcus*[6]", which have been found in such spleens, should be regarded, probably, as fungi and not as protozoa[7].

It seems probable that an occasional case of mycotic splenomegaly[5] may be found in any part of the tropics, and that this disease may develop even in the temperate zone[6 10]. Perhaps mycotic disease of the spleen, on further study, will prove to be not uncommon. On the other hand more evidence would seem desirable to strengthen or to disprove the mycotic origin of such splenomegalies[10].

In a third group of cases the schistosome is absent, fungi have not been demonstrated, and there is no evidence of the presence of malaria. This type of splenic enlargement was observed in the Amazon basin by Councilman and Lambert[8], and was further studied later by Strong[9], the writer and others. The cause is still unknown.

The later stages of these various splenomegalies may be characterized by enlargement of the liver and ascites, as in Banti's disease, but, unlike Banti's disease, anemia is generally a prominent feature of the Amazonian splenomegalies.

We in the Department of Tropical Medicine at Harvard would be glad to receive enlarged spleens for study pathologically and, in particular, spleens of tropical origin would be of the greatest interest to us.

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UNUSUALLY LARGE THYROID DOSAGE. ITS DANGERS: CASE REPORT

BY LEROY E. PARKINS, M.D.*

THE effectiveness of medication is measured by the cure or relief of some disorder. It is sometimes difficult to say exactly how much of a given medicine to administer and how often. The dictum that the dosage is "enough to get proper results" is a little obscure. Thyroid extract is one of the very potent remedies prescribed. How much to give can be ascertained; and some practical rules should govern its dosage. The following case report shows unusual dosage of this drug.

CASE: Mrs. A., age 45. First seen: February 19, 1926.

Complaint: "Shortness of breath."

Present Illness: For four years she had had a chronic cough with moderate dyspnoea. The dyspnoea had varied in intensity; she had been unable to lie flat in bed for the preceding five months. For the past three months she had had moderately severe precordial pain. Four years previously, she was given thyroid extract by her physician; within three weeks her cough improved and gradually disappeared, but she continued to take thyroid extract. At that time her weight was two-hundred and fifty pounds (113.6 Kg.). During the first year she lost fifty pounds, but had been unable to reduce her weight below that level. She had continued to take thyroid extract, to date. She also took iodine (Lugol's Sol.) 5-10 drops each day, for six months, but had had no iodine for three months. She took thyroid extract continuously for four years, as follows: 4½ gr. (.292 gm.) daily for three months; 15 gr. (.975 gm.) daily for six months; 7½ gr. (.487 gm.) daily for three years and three months; a total of 11,805 gr. (667.3 gm.) in four years—an average of 8 gr. (.53 gm.) per day. Burroughs-Wellcome brand of thyroid extract was used during this time.

She came to the office because she was very short of breath. Ten hours after her visit she had acute pulmonary edema and raised a large quantity of blood-tinged, frothy sputum. Dyspnoea and cyanosis became severe. She was comfortable only when sitting erect in a chair.

History: Marital, twice married; never pregnant. *Family history,* negative except that her mother

*For record and address of author see "This Week's Issue," page 247.

weighed two-hundred pounds (90.9 Kg.). *Past history*, negative except that she had a positive Wassermann five years previously and was given a series of intravenous salvarsan injections. *Catamenia*, irregular; marked menorrhagia, lasting three weeks on several occasions during the preceding four years.

Physical Examination: The patient came into the office completely exhausted from dyspnoea. She was a well developed, obese woman, height 5 feet, 8 inches, weighing 206 pounds, (93.6 Kg.). Her expression was anxious, face slightly cyanotic; breathing was labored. She could not lie down on account of marked dyspnoea and discomfort. The most comfortable position was sitting erect.

Heart: Pulse 140. The heart was beating regularly; there were no murmurs; sounds were of distant quality, apparently due to a very heavy chest-wall. Blood pressure 200/120. Fluoroscopic examination showed the heart to be enlarged; and the aorta was tortuous. Six-foot film of the heart showed l.b., 10.5 cm.; r.b., 5.5 cm.; aorta, 7 cm.; transverse diameter of chest 24 cm.; 16% enlargement of the heart.

Lungs: Respirations 32 per minute. Resonant throughout. Crackling râles could be heard throughout both lungs, front and back. Fluoroscopic examination showed very shallow excursion of both sides of diaphragm.

Abdomen: Normal. The liver could not be felt. Extremities normal. There was no edema. Reflexes were normal; otherwise nothing remarkable.

Laboratory: Blood Wassermann negative. Urine normal. Metabolism minus 6, twelve days after onset of present illness; plus 13, thirty-three days after onset of present illness. Pulse rate at first metabolism was 70; at second it was 90.

Treatment: Thyroid extract omitted. Triple bromide, gr. 30 every two hours for three doses. Patient to remain quietly at home. For acute pulmonary edema, 10 hours after first seeing patient, morphia, gr. ¼ s.c. (.015 gm.); repeated six hours later. She was much relieved each time after morphia. Her condition gradually improved and after ten days, she was able to be about her household duties.

The prolonged use of so much thyroid extract seemed incredible, so I telephoned the patient's physician to verify her statements. He said, "Yes, she has myxedema and her mother has it too." Thyroid extract was prescribed for this condition without metabolism test at any time.

Diagnosis: It seems reasonable to assume that the patient's condition was brought on by taking too much thyroid extract. She had a high blood pressure, which was coexistent and not due to thyroid, as it persisted after leaving off the drug. After ten days rest at home the blood pressure was 180/120 and was the same thirty-three days later.

The x-ray of the heart was typical of that seen in hypertension. There was no arrhythmia, or cardiac murmur, or other signs of heart disease at this time. The tachycardia must have been caused by the thyroid medication as the pulse rate dropped from 140 to 70 ten days after the thyroid extract was omitted.

This patient was later cared for by Dr. George E. Tucker, of Salem, Mass., who did three metabolism tests during the following year. All were normal. Within a few months after the writer saw the patient, she developed cardiac disease with decompensation. She died in April, 1927, from cardiac failure. Dr. Tucker kindly furnished this data. He agrees that the patient probably never needed thyroid extract at any time.

Comment: Murray[1] first used thyroid extract in 1891 and its use has been varied since that time. The dosage is still largely empirical, due to the fact that the potency of the drug varies; also, it is often used without metabolism determination to check the result. The active principle of the thyroid is thyroxine. Kendall[2] established this fact in 1915. It has an iodine content of sixty-five per cent.

An interesting laboratory and clinical study was made by Hunt and Sturgis[3], in 1926, when they collaborated in showing that the potency of thyroid extract varies, and that the clinical effect may be increased by lowering the dose and using a different brand. Hunt considers the effect of thyroid extract largely due to its iodine content. Their work was on myxedema patients. A patient took 0.325 gm. thyroid, i.d. (iodine content 0.155 per cent.) with metabolism remaining at minus 6. Later, 0.117 gm. thyroid i.d. was given (iodine content 0.531 per cent.) for 20 days, and the metabolism rose to plus 8, although he had actually consumed only one-third as much thyroid.

In 1918 Aub and Stern[4] reported the case of a woman, age 24, who had heart block. She was given Burroughs-Wellcome thyroid extract, 26 grs. (1.696 gm.) daily for two weeks, then 28 gr. (1.826 gm.) daily for three weeks. In a period of three to four months, she took over 2,000 gr. (130 gms.). In their report they quote Magnus-Levy's case, a patient who received 40 to 76 gr. (3 to 5 gm.) daily for nineteen days.

In giving thyroid extract, it is always best to first determine the basal metabolism. If this is impractical, one can determine the pulse rate, the blood pressure, and the relation of food intake to work. Myxedema patients will frequently have constitutional symptoms, viz. nausea, vomiting, loss of appetite, aching pains in the back and in the bones of the extremities at the beginning of thyroid medication. These symptoms disappear after 1 to 2 weeks. For the first week to ten days, it is advisable to give 2-4 grains daily, then reduce the dose to 1-2 grains daily, or enough to keep the metabolism near to normal. Sturgis and Whiting[5] made a careful study of the methods and technique of treating myxedema patients. In their work they treated patients in the hospital where metabolism tests were done every forty-eight hours. They advise a maintenance dose sufficient to keep the metabolism minus five to minus ten. One of the difficulties with such patients is to keep them taking thyroid extract, as it is a life-time job, and its use should be continued irrespective of intercurrent disease.

Conclusions: (1) For treatment of obesity, thyroid extract should not be used without metabolism determination, unless one is very familiar with the toxic effects of the drug. (2) Thy-

roid extract is not lethal in any ordinary dosage. (3) Its extended use in large doses in obesity may cause nervousness, tachycardia, dyspnoea and acute pulmonary edema.

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HILUM TUBERCULOSIS IN AN OLD MAN

The Early Localization of Tuberculosis in the Lungs in the Adult

BY B. M. FRIED, M.D.*

THE problem of the early localization of tuberculosis in the lungs of adults faces the physician every day; and from a practical standpoint the internist and the general practitioner are apparently more concerned with this question than the specialist in tuberculosis who, paradoxical as it may appear, usually sees the disease when it is in a more or less advanced stage.

Numerous investigations on human material have shown that the first infection with the tubercle bacillus is in all probability effected through inhalation of the infectious material into the pulmonary parenchyma. In the anergic organism the inhaled Koch's bacillus leads to a focal ulceration of the lung tissue accompanied by a tuberculous lymphangitis of the corresponding area followed by an involvement of the tributary lymph nodes. This double lesion designated by the French as "chancre d'inoculation avec adenopathie similaire" and by the German writers as "Primärkomplex" is found in practically every lung examined postmortem (Küss[1], Ghon[2], Opie[3]). Puhl[4] in a recent thorough investigation made in Aschoff's laboratory found the "primary complex" to be present in 62 per cent. of adult lungs examined by him; and the chancre of inoculation alone in 90 per cent. of specimens. Schürmann[5] in a study of a thousand cases found the "primary complex" in the lungs of 80.12 per cent. of the cases investigated by him. It is noteworthy that the primary pulmonary ulceration may be confined to any part of the pulmonary parenchyma *except the apex.*

The fate of the primary infection depends upon numerous causes, the chief of which is apparently the quantity of the inhaled infectious material. It is assumed that one single infection with a small number of tubercle bacilli ends usually in healing, whereas one heavy infection or numerous small infections separated by short intervals will in all probability lead to a progressive ulcerative phthisis. In such instances the lesion undergoes caseation followed by cavity formation with the ultimate dissemination of the germ. Here, therefore, the tuberculous process starts invariably somewhere in the pulmonary parenchyma and necessarily not in the apices.

Why then, does the adult chronic phthisis, as it is generally accepted, begin usually at the pulmonary apex? The discussion of this question will follow the report of the author's case.

*For record and address of author see "This Week's Issue," page 247.

REPORT OF A CASE

A married man of 59 with a history of diabetes mellitus of two years' duration and of tuberculosis of six months' duration. Death. Necropsy finding: Bilateral acino-nodose phthisis spreading from the hilum of the lungs; early cavity formation. Miliary tuberculosis of the lungs. Freedom of apices from tuberculosis. Lobar pneumococcus pneumonia of left lung. Portal cirrhosis of liver, and arteriosclerosis.

History: M., a white man 59 years of age, a native of New England, was admitted to the Peter Bent Brigham Hospital on November 6, 1923 with the complaint of general debility and diabetes. He was chief engineer on a steamboat service for forty years. He was married 24 years to his first wife who died of cancer of the breast and 8 years to his second wife who is living and is well. There were 3 children by the first marriage, one of whom died of diphtheria. He has been an addict to alcohol and a heavy smoker. Thirty years ago he had his arm broken in a railroad accident, forty-five years ago he had a gonorrhoea with complete recovery. He has never been knowingly exposed to tuberculosis.

Present Illness: About two years ago following a severe attack of rheumatism in the knees, thighs, and legs he began to have increased thirst with a slight craving for sweets. For several months he had polyuria and pollakiuria. Six months ago he developed a hacking cough productive of some phlegm. For the last three months he has had dyspnea on exertion. He lost 100 pounds (40 kilograms) in the last two years. The diagnosis of diabetes was made and he was referred to the hospital.

Physical examination: This revealed a very poorly nourished man. His heart showed a soft blowing systolic murmur which was not well transmitted; the superficial blood vessels were markedly arteriosclerotic; the systolic blood pressure was 110, and the diastolic 80. In the lungs there was a slight dulness between the first and second interspaces in front on the right with slightly increased transmission of voice and breath sounds. In each axilla there was a moderate number of fine and medium size râles. Râles were also heard after cough below the right scapula.

Roentgen Ray Examination: A roentgen ray film of the chest (Fig. 1) showed extensive consolidation involving the lower two-thirds of the right upper lobe and a large area around the left hilus. This

area was dense suggesting the possibility of caseation; it contained two central clear areas which suggested cavities.

Laboratory findings: The sputum contained numerous tubercle bacilli. The urine contained 6 per cent. sugar and was positive for acetone. The blood sugar was 200 mlg. per 100 cc. The blood Wassermann was negative. The other laboratory findings were of no importance.

Clinical diagnosis: The diagnosis of diabetes mellitus and pulmonary tuberculosis was made.

Course in Hospital: The patient was put on a diabetic diet with insulin. His blood sugar was controlled. His temperature was elevated varying between 100° and 102°F. He remained in the hospital until November 4, 1923, and was discharged to a sanatorium for tuberculous patients, where he died a few days after admission.

Necropsy: This was performed by the writer about six hours after death. The body showed considerable emaciation; the chest was barrel-shaped and the abdomen was scaphoid. The organs below the diaphragm except for the liver which was enlarged and showed early portal cirrhosis, were not unusual. The heart appeared normal. In the intima of the ascending part of the aorta were three small calcified plaques.

Lungs; Right: The right lung weighed 800 gm. On palpation it contained nodular masses scattered over the middle and lower lobes. On cut surface these appeared to be patches of tuberculous broncho-pneumonia. The lower third of the upper lobe contained a ragged, tuberculous cavity containing a grumous, purulent material. There was an insignificant zone of consolidation around the cavity. *The upper two thirds of the upper lobe were congested but free from any tuberculous process.*

Left: The left lung (Fig. 2) weighed 1360 gm. It was voluminous, heavy and uniformly solid, except for the upper third where it was spongy and crepitant. On cut surface it was gray and friable. At the base of the upper lobe near the root there was a round shallow cavity measuring 2.5 cm. in diameter. The cut surface also revealed tuberculous broncho-pneumonia patches and miliary tubercles. *The apical part of the lung was congested, but was crepitant and showed no disease.* The lower two thirds of the pleura were thickened, being covered with shreds of fibrin. The pleura was adherent to the thorax by easily torn adhesions. There was also a small amount of cloudy fluid in the pleural cavity on this side. The lymph nodes of the hilum were small, hard and anthracotic.

The microscopic examination of the lungs showed tuberculous broncho-pneumonia, miliary tubercles and croupous pneumonia. Special stains showed the presence in the lung tissue of tubercle bacilli and also of a Gram negative diplococcus which was identified as the pneumococcus pneumonia.

DISCUSSION OF CASE

The opinion of phthisiologists is divided on the ways in which an adult person becomes infected and subsequently ill with tuberculosis. Behring was of the opinion that phthisis in the adult is but a "reawakening" of the disease contracted in childhood. He consequently expressed the belief that autogenous infection is the manner par excellence in which a full grown individual contracts the disease. This opinion was strengthened by pathologic reports to the effect that although the primary lesion undergoes calcification and ossification, yet the "immured" tubercle bacilli remain therein alive and virulent. The immunity which most individuals in civilized countries display to tuberculosis was then attributed to the fact that a state of "parasitism" is established between the imprisoned Koch's bacillus and the host which leads to a lifelong condition of allergy and therefore protection against disease. It was also admitted, that although the immunity is very high, it is nevertheless relative and under the influence of some factors the allergic (hyperergic) organism may become anergic (normergic) at which time the tubercle bacilli abandon their sedentary parasitic existence and set up a malady. Largely on the basis of these data the able German pathologist Ranke[6] built up an attractive scheme in which he compared the clinico-pathologic course of phthisis in a human being to that of syphilis. He conceived the idea that like syphilis, tuberculosis can be divided into three phases: the first being that of the "primary complex", the second phase of hypersensitiveness and generalization of the germ, or the period of infancy and early adolescence, and finally the third phase of relative immunity accompanied by localized lesions, i.e. chronic pulmonary tuberculosis of the adult. Ranke then, too, regarded phthisis in the adult as being, as a rule, a "residue" from infancy.

Today one disputes, however, the autogenous reinfection of tuberculosis as being the essential mode of infection in the human adult. Years ago Opie[3] advanced the argument that apical tuberculosis does not have its highest incidence in early adult life when focal infections acquired in childhood are relatively fresh and active but is more common in later life when the focal lesion of childhood has in most instances completely healed. Lawrason Brown[7] and Simpson, also, found that pulmonary tuberculosis in the adult arises elsewhere, often in the opposite lung, and in only two or three instances did they find a suggestion that the adult pulmonary tuberculosis arose in the neighborhood of a primary infection. Finally in recent investigations Opie and Aronson[8] have produced evidences that tubercle bacilli "with few if any exceptions had disappeared from tuberculous lesions when calcification made its appearance".

Apparently the notion of older phthisiologists that tubercle bacilli immured within the calcified lymph nodes remain there indefinitely virulent, serving as "stock" for future reinfections holds true no more. This is of utmost importance in that it discredits the hypothesis that the "primary complex" is a permanent source for autoinfections and also that pulmonary tuberculosis in the adult is as a rule endogenous.

Recent observations are also to the effect that the allergy produced by the first infection fades as time goes on. It is moreover probable that adults like infants contract tuberculosis from the surroundings (exogenous infection), and that the fate of the infection is possibly subject to the same laws: that is, one heavy infection

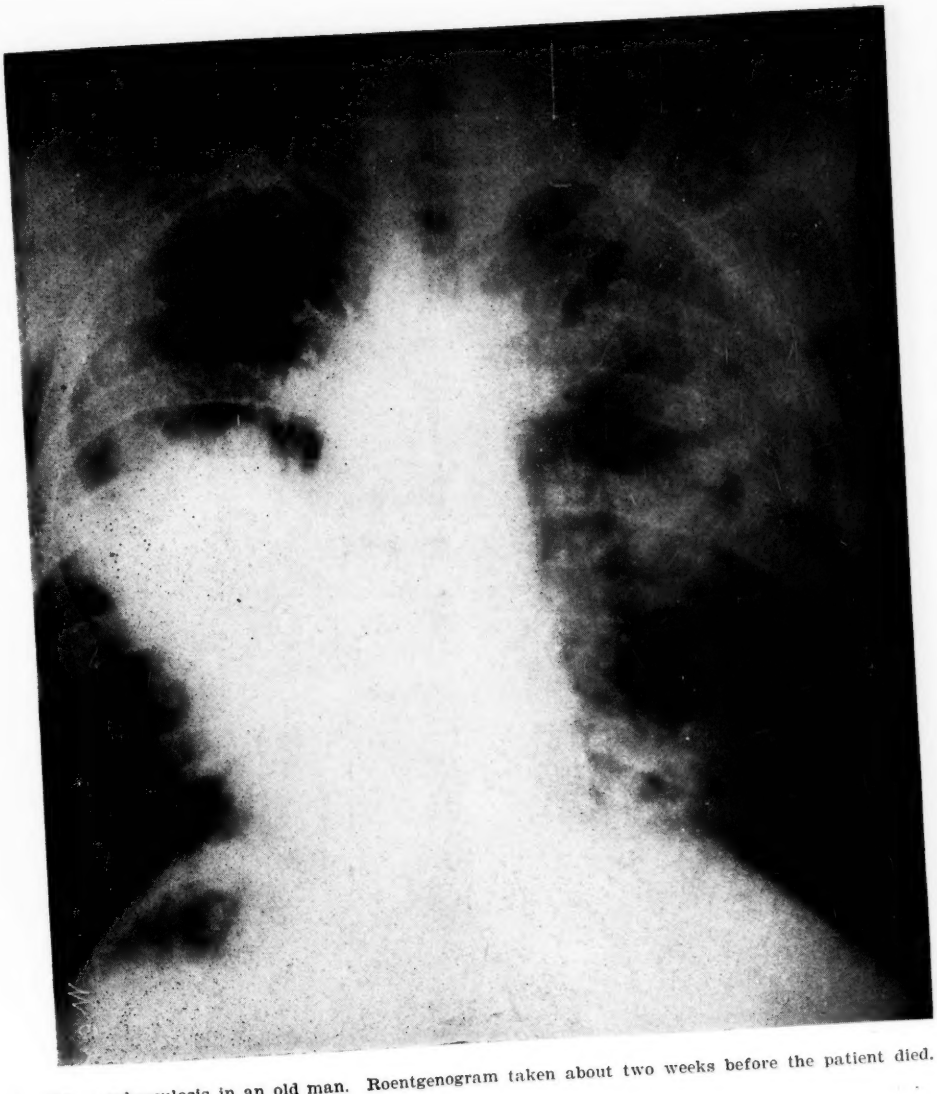

FIG. 1. Hilum tuberculosis in an old man. Roentgenogram taken about two weeks before the patient died. See text.

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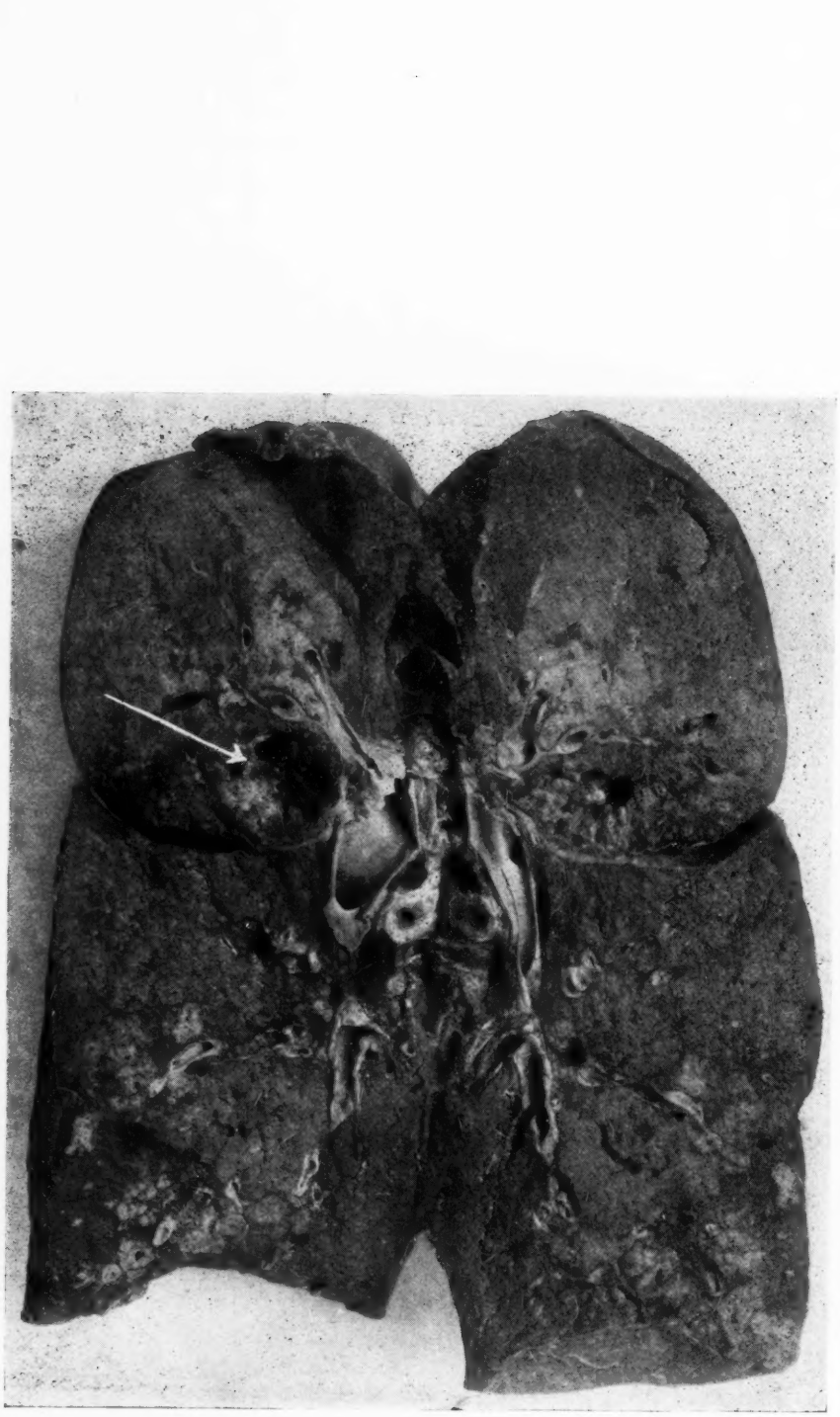

FIG. 2. Hilum tuberculosis in an old man. The cut surface of the left lung, showing lobar pneumonia in the stage of gray hepatization; tuberculous bronchopneumonia; a round cavity at the base of the upper lobe, near the hilum, indicated by arrow, and miliary tuberculosis. The apex of the lung is free from tuberculosis.

or multiple small infections effected at short intervals, in which case there is not enough time to confer a state of allergy and resistance, will lead to a progressive pulmonary tuberculosis. A report by a Norwegian physician, Heimbeck[9], is of particular interest in this respect. His yearly investigations on healthy female nurses whose age varied between 20 and 25 revealed that 52 per cent. of the young women reacted negatively to the Pirquet test. Parallel tests performed on school children at the age of nine furnished only 15 per cent. negative reactions. It is interesting, that most of those nurses who reacted negatively to the Pirquet test developed shortly afterwards active pulmonary tuberculosis while the nurses with a positive tuberculin test remained free from the disease. Heimbeck concludes that all the nurses were undoubtedly infected in childhood (they came from so-called civilized areas where the contamination with tuberculosis is assumed to be universal) but at the ages of twenty and twenty-five the infection of most of them has to all appearances "burned out" thus making them again vulnerable toward new infections.

It occurs to me that the patient here discussed became probably infected and ill with tuberculosis in a manner just mentioned. It is reasonably certain that the present infection was not the first in the patient's life. In the first place, it is most improbable that a person in the conditions of modern civilization should remain normergic toward tuberculosis up to the age of sixty. In the second place, the lesion found in the lungs at necropsy was not characteristic of the "primary complex". It is obvious then that he became anergic following an extinction of the immunity acquired from his previous infections in which diabetes has possibly played the rôle of a debilitating condition, which not infrequently leads to abolition of the state of resistance to disease.

But the outstanding feature in this case is the fact that the disease started not at the apex but below this structure, within the pulmonary parenchyma, while the apices themselves remained untouched. As stated above, the primary childhood infection is never localized at the apex. The causes for apical localization of chronic phthisis in the adult is attributed to mechanical and physiologic peculiarities of the thorax, or to the respiration itself. According to Calmette[10] the apical lesion in the adult is primarily due to the special disposition of the lymphatic vessels which allow a stagnation. Letulle and Hallbron[11] quote Hannau to the effect that "the inspiratory muscles at the apex are stronger than the expiratory and as a result the tubercle bacillus analogous to carbon pigment reaches this region very easily, and leaves it with difficulty". Beitzke[12] also speaks of some local anatomic peculiarities of the pulmonary apex which permit the tubercle bacilli to fix themselves predominantly in this area. Like Calmette he attributes the fixation of Koch's bacillus at the apex to the shallow breathing of this part of the lungs. These hypotheses are, however, not borne out by close observations. Thus "shallow" or sluggish breathing is artificially induced by pneumothorax as a salutary measure in pulmonary tuberculosis. Moreover, a recent investigation by Walsh[13] has shown that the apical part of the lung breathes apparently more intensely than other parts of these organs. In brief, the apical localization of incipient chronic phthisis of the adult has never been adequately explained.

The German roentgenologist Assmann[14] was the first to call attention to the fact that in young individuals between the ages of 15 and 25 the tuberculous process frequently starts not at the apex but underneath the clavicle. He therefore designated the disease as infraclavicular tuberculosis. Assmann's first observation has since been confirmed and broadened by Redeker[15], Romberg[16], Lydtin[17], Alexander[18], Ulrici[19], and others. Redeker[15] produced evidences that the earliest lesion of post adolescent phthisis is confined to the middle of the pulmonary field; and other observations are to the effect that it is not infrequently seen around the hilum and also in other parts of the lungs. Romberg and Lydtin[17 and 20] emphatically state that phthisis in the adult begins at the apex in a limited percentage of cases only, and that the disease in these cases is usually benign and promptly curable. All the writers cited above are of the opinion that, as a rule, the lesion starts underneath the clavicle, at the hilum or elsewhere in the pulmonary parenchyma. The onset is acute and the lesion is either circumscribed being accompanied by an intense inflammation surrounding the tuberculous focus, or it is confined to the peribronchial and perivascular spaces. This in most instances heals; in others it remains active, being localized, however, for a certain period of time. In those instances in which the disease progresses it leads soon to cavity formation ("Frühkaverne" of the German writers), this serving as a point of departure for metastases to remote parts or to reinfections by aspiration. The metastatic, or "daughter foci" disintegrate more rapidly than the primary "mother infiltrate" giving the picture of a chronic phthisis of the adult. The infraclavicular "mother infiltrate" has a tendency to progress toward the apices, where it rapidly leads to profound tissue disintegration, giving the impression that this part of the lung harbors the older and therefore the primary lesion. Redeker affirms that the conception that pulmonary tuberculosis in the adult begins invariably at the apex is an "erroneous dogma"; and in a recent report from Romberg's clinic, Lydtin[20] states that it is "a theoretical fiction".

These observations seem to find support in recent studies made in this country. Fishberg[21], for instance, says that: "the earliest active and

progressive tuberculosis lesion, is in the majority of cases found in parts of the lung below the clavicle''. On roentgenologic examination of the chests of 182 patients with diabetes mellitus Sosman and Steidl[22] found 45 with signs of pulmonary tuberculosis. Twenty one, or 46 per cent. of studied cases showed tuberculosis confined to the hilum of the lungs while the apices remained free from any lesion. Diabetes, as referred to above, played in these cases probably the rôle of a debilitating disease abolishing the relative immunity to tuberculosis. It is, however, improbable that it should be responsible for the non-apical localization of the incipient lesion. The disease here was ''caught'' in the early stages because of the patients' diabetes which led them to the clinic thus affording the opportunity of a precocious examination of their lungs. In the author's case, the patient died of lobar pneumonia. On examining his lungs after death it appeared to me that should the patient survive for a longer period of time the landmarks of the primary lesion which was at the hilum, would have entirely disappeared. Indeed, as Virchow stated: ''Death alone gives us no information concerning life'' (Das Tode allein giebt uns keinen Aufschluss über das Lebende).

These statements though made by serious observers are however not yet verified by post-mortem examinations, and the roentgenologic aspect of the lung on which the new conception is based may be ambiguous. Indeed, Bacmeister[23], in a recent study does not accept *in toto* the opinion of Assmann, Romberg, Redeker and others. He does not think that the ''infraclavicular infiltration'' is the earliest tuberculous lesion in most instances, and that the ''Frühinfiltrate'' invariably serves as a point of departure for the development of the disease in the adult. He, too, however, is of the opinion that when the lesion starts at the apex it is relatively benign in the majority of cases.

Interestingly enough the Assmann-Redeker-Alexander conception of the early localization of pulmonary tuberculosis in the adult was emphatically stressed years ago by a British worker. In 1912 Jordan[24] from the Guy's Hospital basing his observation on ''some thousands of radiographic examinations'' affirmed, that ''more frequently by far the disease (tuberculosis) commences at the roots, and extends along the branchings of the large bronchial tubes''. He further states that ''of 150 consecutive x-ray examinations in cases in which the diagnosis of phthisis was clinically certain (tubercle bacilli, in the sputum, wasting, etc.) while there was no complication, the disease was shown by the x-ray examination to be purely apical in 32 cases only. In 59 cases the disease was confined to the region of the roots—these were cases of pure peribronchial phthisis while in 59 cases it affected apices and roots in one or both sides''. The peribronchial phthisis, according to Jordan[24] is nearly twice as common as pure apical phthisis, only a little more than 20 per cent. of the cases of undoubted phthisis are in his experience purly apical, nearly 40 per cent. are purly peribronchial, while 40 per cent. are both apical and peribronchial. The plates illustrating Jordan's article strikingly resemble those of Redeker, Lydtin, Alexander and others.

The case with necropsy herein reported as well as the roentgenologic series reported by Jordan and by Sosman and Steidl are interesting in still another way: they demonstrate that ''infraclavicular tuberculosis'' is not a disease of puberty only, as thought formerly by Assmann and Redeker, but it is apparently not rare among persons of all ages including the very old.

SUMMARY

The notion of older observers that pulmonary phthisis of the adult begins invariably at the apex holds true no more. In a very high percentage of cases, the exact number of which cannot be stated, the disease begins in the pulmonary parenchyma underneath the clavicle, or around the hilum whence it spreads. It is moreover observed that in instances when the infection implants itself primarily at the apex the disease is relatively benign and promptly curable.

Likewise the conception that in full grown individuals the infection of the lungs with Koch's bacillus is as a rule endogenous, being a residue from infancy, is disputed. Today there is a prevalence of opinion that the exogenous route is probably the more common means of pulmonary infection with the acid fast bacillus in adults.

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POWDERED MILK AND THE PUBLIC HEALTH*

BY JAMES A. TOBEY, M.S., Dr.P.H.†

POWDERED MILK seems to be the most industrially progressive of all dairy products. In the short space of ten years the production of dried whole and dried skim milk in this country has nearly quadrupled, an advancement surpassing all other articles in the dairy industry. During the same decade, from 1918 to date, our total milk production has increased more than 40 per cent., a propitious and healthful expansion, but obviously less striking than the increment in powdered milk alone.

The great increase in the production and use of powdered milk has occurred chiefly because of economic reasons, though the benefit from the standpoint of public health may have been an inducement, and certainly has been in some degree a result[1]. On the economic side, industrial leaders are beginning to realize that it is not particularly good business to utilize valuable space for the shipment of fluid milk containing approximately 87 per cent. water when the same whole milk in a powdered form, with only about 2 per cent. water, can be transported in about one-eighth the space.

Not only does powdered milk offer an economic saving in bulk, but it presents a method of storing and keeping a perishable food, and making it readily available in a convenient and inexpensive form. It also offers an efficient method to avoid waste, particularly in the skim milk field, where most of the skim milk residue from butter-making is now utterly wasted and not utilized for the valuable food which it is.

The statistics of the United States Department of Agriculture on dried milk[2] reveal that the manufacture of powdered whole milk in this country increased from about four million pounds in 1918 to nearly eleven million in 1926, while powdered skim milk made the remarkable expansion from some 26 million pounds in 1918 to nearly 92 million in 1926. Dried buttermilk showed a similar increase, from five million pounds to more than 31 million during the same period, and malted milk went forward from somewhat over 15 million pounds to more than 20 million. Exact figures for this period are shown in the accompanying table. In 1927 the total production of all dried milk products amounted to 186,393,000 pounds, or 50,000,000 more than in 1926.

TABLE I*

PRODUCTION OF DRIED MILK IN THE UNITED STATES

(Thousand pounds, i. e., 000, omitted)

Product	1918	1922	1926
Powdered whole milk	4,006	5,599	10,768
Powdered skim milk	26,202	40,617	91,718
Powdered buttermilk	4,951	9,007	31,378
Dried casein (skim)	10,936	6,907	16,983
Malted milk	15,623	13,659	20,673
Totals	61,718	75,789	171,430

Powdered cream and dried casein (buttermilk) omitted.

*Data taken from Handbook of Dairy Statistics, U. S. Department of Agriculture, 1928.

When it is considered that processes for the desiccation of milk date from 1855 when Grimwade received his patent in England, and that malted milk was a commercial success in 1883, this recent development of the dried milk industry is all the more significant. Most of the successful schemes for powdered milk have, moreover, been patented during the twentieth century, beginning with the spray process of Stauf in 1901 and the roller process of Just in 1902. The Merrell brothers and Gere invented another spray process in 1905, and after 1913 Gray and Jensen secured patents on still another. To-day, the spray system of drying milk is the most popular, fully 90 per cent. of all powdered milk manufactured in the United States being produced by this process.

In the Merrell-Soule spray process, tested milk is condensed in vacuum and then pasteurized, or vice versa. It is next forced under high pressure through fine nozzles into a steel chamber, heated to a temperature of about 270 degrees Fahrenheit. This high temperature causes the remaining moisture to evaporate rapidly and pass out at the top of the chamber. The resulting milk powder collects at the bottom and is immediately or frequently removed in order to prevent cooking and other unfavor-

*Read before the International Association of Dairy and Milk Inspectors, Chicago, October 13, 1928.

†For record and address of author see "This Week's Issue," page 247.

able effects. In the roller process, pre-condensed milk is poured in a film upon revolving steel drums, heated to a high temperature. In some cases this drum is enclosed in a vacuum chamber, in others it is not. The moisture evaporates and the resulting powder is scraped from the drum.

Although the greater part of the powdered milk now produced is made by the spray process, much of the scientific literature which has been published on the bacterial content of dried milks seems to deal chiefly with those manufactured by the roller process. The principles resulting from these studies are, however, applicable in a general way to all powdered milks and a brief review of them will be of value.

The bacterial content of dried milks was apparently first studied by Delephine, in England, in 1914. In a report to the Local Government Board[3], he stated that milk received from the farm had more than 14,000,000 bacteria per gram, while after the spray process the finished product had only 154,000. Another sample containing 588,000 bacteria had only 14,600 after the hot roller process, while a third with the astounding bacterial content of 104,900,000 was reduced in bacteria to 4,900 after this same process. As was well pointed out by Dr. H. W. Redfield, in commenting on these results in a paper on "Remade Milk" delivered before the International Association of Dairy and Milk Inspectors, in 1919[4], the whole milk supply of England showing such great contamination at that time needed urgent attention from a reputable group of sanitary inspectors.

Delephine reported in his 1914 paper that the tubercle bacillus was attentuated but not destroyed by the drying of milk. In 1925 two other British investigators, Hunwicke and Jephcott, conducted tests on the destruction of bacteria by the roller process[5] and found that the tubercle bacillus was destroyed or rendered avirulent, since they could get no tuberculosis in guinea pigs inoculated with powdered milk made from whole milk containing the bacillus. Since proper pasteurization is known to-day to be destructive to the tubercle bacillus, and the temperature used in drying is also usually above the thermostable limit of this organism, it can be stated with certainty that modern powdered milks are free from the tubercle bacillus, a fact confirmed by recent investigations by Shrader and others[6].

During the war "reconstructed milk", made from butter fat and skimmed milk powder, was used to advantage in a community of 25,000 persons employed in a government ordnance plant. Studies of the bacterial content of this reconstructed milk showed it to be satisfactory from the health standpoint[7]. In 1919 the United States Public Health Service conducted an investigation of dried milk powder in infant feeding, in which 287 babies in Boston were divided into three groups, one fed on Grade A cow's milk, the second on whole milk powder, and the third on a reconstructed milk made from skimmed milk powder and sweet butter fat. The conclusion was reached that the dried milk powders, and their remade products used in the study were safe for infant feeding, and the statement was also made that a freshly opened can of whole milk powder had a count of 1060 bacteria per cubic centimeter[8]. In these experiments Klim, made by the spray process, was used. During the hot days the count of the Grade A milk was said to have run as high as 200,000.

Powdered milk is invariably low in bacteria immediately after the drying processes, but it may be susceptible to contamination in later handling. Supplee and Ashbaugh[9] report that the bacterial content of powdered milk as it comes from the cylinder averages less than 1000, regardless of the original content, although some of the whole milk used had as many as 354,000,000 bacteria. These writers show that the powder may be recontaminated, but that the bacteria tend to be reduced by storage. In another paper[10] these writers report that the decrease in the original bacteria content of the milk after the roller process is about 45 per cent., as determined by the method of "microscopic examination". On the other hand, Jephcott, Hunwicke and Ratcliffe state that the number of bacteria in stained centrifugalized deposits of reconstituted dried milk made by the roller process bears no relationship to the plate counts, nor, apparently, to the number of bacteria in the original milk[11].

The number of organisms in the original milk before drying and the number in the finished product are both matters of importance. According to Jephcott, Hunwicke and Ratcliffe[12], the number and natures of the living bacteria in the final product is regarded as the most useful method of judging purity, but Shrader, Ewing, Korff and Conn have pointed out recently[13] that chemical analysis of milk powders showing the approximately proportional content of ammoniacal products indicates the bacterial content of the original supply, because excessive bacteria counts tend to decompose the milk.

The work of Shrader and his colleagues was done on 1000 samples of commercial milk powders purchased at various places in Baltimore. Most of these samples were taken from large commercial packages such as barrels and drums, in which these powders are shipped to the industry for use in baking, ice cream making, and similar trades. Plate counts of these samples ranged from several instances of approximately 1000 bacteria to one of 26,000,000, with an average of 750,000. The Breed counts were, of course, much higher. A sample of Klim from the original pound container had only 12,000 bacteria by the plate method[14].

While this study indicates that many of the

commercial milk powders sent to the trade are either manufactured from milk high in bacteria or else are handled in an unsanitary manner, it can be asserted that the larger and more reputable manufacturers of dried milks realize that there must be clean milk to begin with, and this is especially true of the concerns marketing milk powder for infant feeding in small receptacles. It is also true of their bulk goods. The evidence on this point seems clear from the authorities already cited[15], as well as on theoretical grounds.

Although more than 1300 outbreaks of disease due to contaminated milk and milk products are on record[16] no epidemic or outbreak of disease has ever been reported as due to any of the concentrated forms of milk, including condensed, evaporated, and dried. Safety seems, therefore, to have been and to be a leading characteristic of these forms of milk. In only one instance has suspicion even been directed at a concentrated milk. In that case powdered protein milk was involved, but a careful consideration of the evidence shows that none of the circumstantial facts mentioned in a published report of the epidemic[17] are sufficient to justify a verdict of guilty against this milk powder.

In the summer of 1927 an epidemic of enteritis occurred in an institution in Chicago caring for homeless infants. According to the paper on this unfortunate event by G. F. Dick, G. H. Dick and J. L. Williams[18], 88 babies were stricken and 27 died. Investigations by the authors determined that this epidemic was primarily due to an intestinal infection and was caused by the Morgan dysentery bacillus, which was isolated from several bodies on autopsy.

When precautions were finally taken to prevent any possible further dissemination of this intestinal disease, the epidemic came to an abrupt end. These precautions consisted of eliminating the possibility of contamination by the fingers of the nurses, and the using of boiled fresh milk preparations for feeding. The infants had been receiving powdered protein milk. This is milk made by inoculating pasteurized skimmed milk with a selected culture containing several strains of lactic acid bacteria, with the streptococcus lactis predominating. The cultured milk stands until the acidity reaches a pH value of 4.8, when the whey is drained and cream is added. The product is then dried.

A bacteriological examination of this powdered protein milk was made by the Dicks, who reported[19] that they found green-producing streptococci. They failed to report, however, whether these streptococci were of the human or bovine type, a good example of superficial science. Most bacteriologists differentiate hemolytic streptococci of the human type such as the pyogenes, which are pathogenic to man, and the hemolytic streptococci of the bovine type, such as the mastiditis, which are not pathogenic to man. The Dicks did not report the presence of the Morgan dysentery bacillus in the powdered milk, though this was stated to have been the cause of the epidemic. Any inference that the powdered protein milk was in any way implicated in this epidemic is, therefore, obviously erroneous.

Powdered milk is a real factor in modern public health. Milk is the most nearly perfect of all the foods of man, because it is the only single article of diet which contains practically all of the elements necessary to nourish the human system. When it is said that milk is the most nearly perfect of foods, pure milk, is, of course, meant. Powdered milk distributed for individual use is invariably pure milk and so is that produced for commercial purposes by reputable concerns. As the professions and the public realize the many advantages of milk in powdered form, this kind of concentrated milk will enjoy a popularity even more remarkable than at present.

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Case Records
of the
Massachusetts General Hospital

ANTE-MORTEM AND POST-MORTEM RECORDS AS USED IN WEEKLY CLINICO-PATHOLOGICAL EXERCISES

EDITED BY R. C. CABOT, M.D.

F. M. PAINTER, A.B., ASSISTANT EDITOR

CASE 15051

WHITE SPOTS BEFORE THE EYES

MEDICAL DEPARTMENT

First admission. An American housewife fifty years of age consulted her physician for the first time with a complaint of shiny spots before her eyes.

Family history. Her father died of tuberculosis twenty-three years before. The patient was exposed during his illness. Her mother had migraine. Her family history was otherwise negative.

Past history. She was born in the United States and had lived here all her life. She had the usual children's diseases, including what were supposed to be two attacks of measles, with the second of which she had some joint pains but no characteristic history of rheumatic fever. Twenty years before admission she had "a slight spot" on the right lung. She was treated for tuberculosis and had never had further symptoms. She had had many bad colds and frequent infections of the left antrum. For twenty-two years she had been told that she had a "leaky heart valve", but had had no symptoms other than slight dyspnea on fairly extreme exertion. Operations: repair of cervical lacerations. Catamenia began at thirteen years; always regular up to two years ago. Since then she had skipped a few periods and had had on one occasion a ten-day period of menorrhagia.

Marital history. She had had nine pregnancies and two miscarriages. Habits: unimportant.

Present illness. Fourteen days ago she suddenly noticed large white spots before her left eye coming and going but with no impairment of vision. A local examination by an opthalmologist showed no lesion in the eye. A week before admission she noticed a dull frontal headache. The scotomata had persisted and were present whether the eye was open or closed. There had been no vertigo and no tinnitus.

Physical examination showed tenderness on pressure over both frontal sinuses and both antra. The chest showed no abnormalities to percussion or auscultation over the lung fields. The heart was not enlarged. Percussion showed the left border 7 centimeters, the right 2 centimeters from the midsternal line, the supracardiac dullness 4 centimeters. The apex impulse was not seen but was indefinitely felt at a point corresponding with the left border of dullness as measured by percussion. There was a questionable thrill. The first sound was short, snapping and in the recumbent position was preceded by a short rumble. At the apex a very soft systolic murmur was heard which was transmitted a short distance into the axilla. At the base a long, loud, high-pitched diastolic murmur was heard along the left sternal margin. This murmur could not be heard at the apex. Pulses equal, regular, synchronous. No capillary pulse, pistol-shot or Duroziez sign. Blood pressure 104/62 and 110/72. Abdomen soft, tympanitic throughout. No masses or tenderness. The right kidney however was easily palpated. There was no edema of the extremities. Normal pupils reacting to light and distance. Reflexes and sensation were normal.

Urine: specific gravity 1.032, acid, albumin 0, sugar 0, bile 0, sediment negative.

The fundi were again examined by an opthalmologist and pronounced normal. The X-ray of her sinuses showed no lesions other than slight dullness in the left maxillary antrum. A nose and throat consultant was unable to find any evidence of pathology in the nose, throat, ears or sinuses.

Further laboratory work showed a negative blood Wassermann, non-protein nitrogen 30.3 milligrams, blood uric acid 4.2 milligrams, leukocyte count 7,600, hemoglobin 85 per cent, red cells 4,690,000; differential count: polymorphonuclears 77 per cent, small lymphocytes 18 per cent, large mononuclears 2, eosinophiles 1, basophiles 1.

The symptoms cleared up with five days of rest in bed and she was discharged with the recommendation to rest for several weeks.

Interval history. During a period of four years the patient remained relatively well except for slight discomfort in the upper abdomen not directly related to meals. A complete gastro-intestinal series of X-rays was done during this period and showed only slight evidence of colitis. One year before her re-ëntry she consulted a gynecologist for two attacks of menorrhagia. He found a cervical polyp, which was excised. The histological report on this and also on uterine curettings was that there was no evidence of malignancy. On frequent examinations of her heart during this period the murmurs remained unchanged. Six weeks before re-ëntry she noticed that she was for the first time dyspneic on very slight exertion. She was put to bed for a week with apparent improvement. A week before re-ëntry she noticed discomfort in the lower left chest made definitely worse by deep inspiration.

Second admission.

Physical examination showed the same heart and chest findings as before, but also a mass 9 centimeters in diameter, smooth, firm but not hard, slightly tender, descending below the left costal margin with each inspiration.

Her urine examination at this time showed a gravity of 1.014, the slightest possible trace of albumin, sugar 0, very rare hyalin casts. Blood examination showed a red count of 4,100,000, leukocyte count 196,000, hemoglobin 70 per cent, a differential showing 50 per cent myelocytes, many of which were eosinophilic in type. There were many immature polymorphonuclears and relatively very few lymphocytes.

X-ray treatments were started. Her white count varied from 24,000 to 80,000 during the period of treatment. Her basal metabolic rate was —3 per cent. Following the course of X-ray treatment she passed a very comfortable summer. Late in September however her right leg became swollen, red and very painful.

Third admission.

Physical examination as before except for large, tender, vaguely outlined areas of erythema and edema on both legs, suggesting erysipelas, but not typical.

For several days she ran a temperature reaching 102° each afternoon. A differential count by Dr. Minot five days before death showed a myeloblast count of 8 per cent., myelocytes 10 per cent. and only two nucleated reds. The inflammatory lesions of the skin of the legs failed to clear up and a similar lesion developed on her left arm. The temperature continued high. Her white count rose to 108,000, but the percentage of immature cells did not increase. The day before death her respirations became rapid and shallow and she complained of severe pain in her left side. An X-ray plate of the lungs showed no evidence of pneumonia. The next day she had a sudden acute vomiting attack and died almost instantaneously.

Discussion

BY RICHARD C. CABOT, M.D.

NOTES ON THE HISTORY

I do not remember hearing a complaint of shiny spots before the eyes. Generally they are dark spots.

A "spot on the lung" means tuberculosis. I do not know why people use the term.

"Scotomata" cannot be right, for that means dark spots.

NOTES ON THE PHYSICAL EXAMINATION

In a woman who has had a heart lesion for a long time mitral stenosis is the ordinary thing, and this is the ordinary murmur of mitral stenosis.

There is certainly nothing to suggest aortic regurgitation in the pulse, although the murmur does suggest it.

What the heart trouble had to do, if anything, with the bright spots I do not know.

The mass was I suppose the spleen. It was not described so that I should recognize it, but by the other evidence it seems like the spleen.

The rise in the white count was due to the X-ray treatment, I suppose. One expects increase in the metabolism on account of the production of new cells.

DIFFERENTIAL DIAGNOSIS

We cannot very well be wrong on the two main lesions in this case. We have to say that they have no possible connection with each other. Usually it is safer to make all the facts in the case hang together in one diagnosis; but we cannot here. With the blood of mylogenous leukemia seen in life we have just as good a diagnosis as we get post mortem. We can make it with the essential examination of tissue during life. The heart is more doubtful; but a long-standing heart disease in a woman with no evidence of syphilis is almost always mitral stenosis. It is safe to say that. Whether she had aortic regurgitation too I do not know. I do not think aortic regurgitation alone is possible. I think she certainly would have had more evidence either of aortic stenosis, or of a Corrigan pulse with big pulse pressure if she had had aortic regurgitation without mitral disease. But if combined with mitral stenosis it would give the picture we have here. The chances are that there will be at least some chronic endocarditis on both these valves.

I do not know what the nature of her terminal infection was. They are not willing to say erysipelas. Nothing is given us to identify it with any other infection. Could it be phlebitis? It does not sound like it. Both legs are swollen in the end, and they speak of areas on the arm as well. I do not think I can say what these appearances were. Did they show post mortem?

Dr. Tracy B. Mallory: No.

Dr. Cabot: Still I think it is quite probable that she had some terminal infection, though I cannot locate it. The two essential diseases remaining are (1) chronic endocarditis probably of two valves, aortic and mitral, and (2) myelogenous leukemia.

A Student: Do you ever get rupture of the spleen in these cases?

Dr. Cabot: Yes, it has been known.

A Student: She had pain in the left side.

Dr. Cabot: That is more likely to be due to adhesions. That is one of the reasons the spleen is so difficult to take out at operation. But rupture of the spleen gives more stormy symptoms.

A Student: Is there a chance of tuberculosis being the terminal infection here?

DR. CABOT: I do not see how miliary tuberculosis can be ruled out. That is the only type we can suppose.

A STUDENT: What is the cause of the sudden death?

DR. CABOT: I do not know. Miliary tuberculosis is suggested, and it is a perfectly possible thing. I think it is more than possible that we shall not find any cause. That is the commonest finding. After that the commonest findings in sudden deaths are cerebral hemorrhage and infarction of the heart. But the commonest cause of sudden death is no discoverable cause.

A STUDENT: How often will a mitral stenosis go through nine pregnancies?

DR. CABOT: Certainly that is unusual. It is not uncommon to have it go through two or three, but I never heard of nine.

A STUDENT: Is there any chance of congenital heart disease?

DR. CABOT: I am against a congenital lesion.

A STUDENT: Could that diastolic be a Graham-Steele murmur?

DR. CABOT: Yes; but the reasons against that are that we usually get Graham-Steele in cases showing a great deal more decompensation than she showed.

A STUDENT: Would the negative X-ray rule out bronchopneumonia?

DR. CABOT: I do not know. We should have to ask an X-ray man about that.

A STUDENT: The heart was not enlarged in this case?

DR. CABOT: There is no evidence of enlargement.

A STUDENT: You could not very well say that she had valve lesions if the heart was not enlarged.

DR. CABOT: I said we have no evidence of it. We have no X-ray, which is the only way to be sure of it. We have only percussion, which is unreliable. But I believe the right heart is enlarged and probably the left too.

A STUDENT: Are the skin lesions associated with the leukemia?

DR. CABOT: There are skin lesions associated with leukemia. I do not remember any lesions described like this.

A STUDENT: Could the terminal picture be explained as an acute exacerbation of the leukemia?

DR. CABOT: I suppose so. But I try to mention only what we can verify post-mortem.

A STUDENT: How about a terminal hemorrhage?

DR. CABOT: We have not enough evidence of symptoms of hemorrhage.

A STUDENT: How about cerebral hemorrhage?

DR. CABOT: I have known deaths from cerebral hemorrhage in leukemia. But we ought to get more evidence of paralysis than we have.

A STUDENT: Wouldn't that vomiting go with cerebral hemorrhage?

DR. CABOT: Yes, but that is not enough.

A STUDENT: Could cardiac failure give rise to vomiting?

DR. CABOT: Yes.

A STUDENT: Could that pain on the left side be due to pleurisy?

DR. CABOT: I have forgotten whether or not it was in the chest.

A STUDENT: It was in "the left side".

DR. CABOT: We do not know whether it is above or below the diaphragm. Even if it was above the diaphragm it might be due to the spleen pushing the diaphragm up. I think the best thing to say is that it is due to the spleen.

A STUDENT: How often do you get erysipelas on the leg and not on the face?

DR. CABOT: Often. The trouble for us is that they will not say this is erysipelas.

A STUDENT: Is this a chronic or an acute myelogenous leukemia?

DR. CABOT: I do not know how we can tell. It was found suddenly, of course, but it may have been going on for a long time. It is almost impossible to tell unless you have a patient under observation before the disease begins.

DR. MALLORY: This patient was under observation for a period of eight years, but nothing brought their attention to the blood. Over one period of three years it was not examined.

DR. CABOT: You could not call a disease acute if it has been going on for three years, as it might have been.

A STUDENT: Would the eye symptoms point to leukemia?

DR. MALLORY: At the time of those symptoms the blood was negative.

DR. CABOT: I do not know what the eye symptoms mean.

CLINICAL DIAGNOSIS (FROM HOSPITAL RECORD)

Chronic myelogenous leukemia.

DR. RICHARD C. CABOT'S DIAGNOSIS

Myelogenous leukemia.
Rheumatic endocarditis of the mitral and aortic valves. Mitral stenosis. Probably aortic stenosis.

ANATOMIC DIAGNOSES

1. *Primary disease.*

Myelogenous leukemia.
Myeloblastoma of the liver.

2. *Secondary or terminal lesions.*

Rheumatic endocarditis: mitral stenosis and aortic stenosis and insufficiency.
Acute vegetative endocarditis.
Septic infarction of the spleen.
General peritonitis.
Septicemia.
Healed tuberculosis of the lungs.

DR. MALLORY: This case is in itself almost a museum of pathology. First, as to her heart. It was not hypertrophied. It weighed over 345 grams. The right ventricular wall was a little thick, measuring 4 millimeters against the normal of about 3 for a heart that size. There were no thrombi in either of the cavities. The circumference of the mitral valve measured 7 centimeters, which is less than normal. There were very dense old fibrous scars with interadherence of the margins of the cusps to produce a slight but definite stenosis. Also on one cusp there were two minute ulcerative perforations and on the other cusp a fairly large shaggy vegetation. The aortic valve measured 5 centimeters. Two of the cusps were quite definitely interadherent. The deformity was such as would produce both stenosis and insufficiency in moderate degree. The lungs showed a definite healed tuberculous lesion.

Both the liver and spleen were greatly enlarged. The liver weighed 2550 grams, the spleen a little over 1 kilogram. The spleen showed several infarcts, a not uncommon finding in leukemia, but probably in this case directly due to bacterial endocarditis, since two of these infarcts had become purulent and one had ruptured, producing general peritonitis.

Microscopic examination was interesting in showing a diffuse lymphomatous involvement of almost all the organs and also of the heart, where it was possible to find side by side areas of leukemic infiltration and also focal collections of cells similar in character to Aschoff bodies, although containing eosinophiles in fairly marked numbers. I imagine these were directly due to the acute bacterial endocarditis.

The only organism recovered in pure culture from heart and spleen was the bacillus coli.

DR. CABOT: What was the cause of sudden death?

DR. MALLORY: I cannot say. Peritonitis was probably the most immediate cause of death, but that would not explain why it should happen in a few seconds.

DR. CABOT: Had that peritonitis been going on for a long time?

DR. MALLORY: No; about twenty-four hours.

CASE 15052

A SURGICAL CASE COMPLICATED BY A UROLOGICAL PROBLEM

SURGICAL AND UROLOGICAL DEPARTMENTS

First admission. A Canadian housewife of forty-three was admitted to the hospital May 7 complaining of an abdominal mass of two months' duration.

Her father had died of Bright's disease, her mother of cancer of the breast. She had lived with two brothers and a sister, all of whom had died of pulmonary tuberculosis.

For the past eight years her general health had been only fair and she had been easily tired and nervous. Ten years ago she had had hay fever. The same year a papilloma of the vulva had been excised. She had influenza eight years ago and again during the past year. For several years she had noticed slight dyspnea and precordial "tiredness" on exertion. Her bowels were chronically constipated, no more so, however, during the past year. At frequent intervals during the past nine years her right eye had been bloodshot. For the past year her menstrual flow had been twice the normal amount, accompanied by urination two or three times at night. There had been slight pain in the region of the left elbow during the past two months and similar pains in both knees.

The present illness, according to the patient, dates back two months before admission, when she noticed a painless, movable mass in the lower abdomen. This was described by her as being larger than an egg.

Physical examination showed a woman in good general condition. There were signs of an old healed process in both lungs. The heart was normal in size and position and there were no murmurs. Examination of the abdomen revealed the presence of a mass larger than a grapefruit extending from the pelvis nearly to the umbilicus. In front of this large mass, and seemingly superimposed on it, could be felt two smaller masses about the size of lemons. These were movable and very hard. One of the smaller masses was situated just above the symphysis, the other further posteriorly and to the left. The large mass was easily appreciated on pelvic examination and the cervix was felt to move with the mass. The cervix was normal in appearance. A considerable degree of cystocele was present. No other physical abnormalities were noted.

The urine contained no albumin and a few leukocytes. The blood was not recorded. The chart was not remarkable.

Pre-operative diagnosis: Fibroids of the uterus. Operation was performed May 9. At operation the uterus was found to be the seat of multiple fibroids and was firmly adherent to the pelvic walls and to the intestines. These adhesions were freed with considerable difficulty. The uterus and both tubes and ovaries were removed. A cyst ten centimeters in diameter was present in the right broad ligament.

PATHOLOGICAL REPORT

A nodular uterus enlarged to the size of a cantaloupe, amputated through the cervix with both adnexa attached. On section its walls and surfaces are studded with spherical fibrous tumors, the largest of which measures eight centimeters in diameter. The cavity is dilated. The endometrium is thick and polypoid. The ovaries are flattened, slightly enlarged and fibrous. The Fallopian tubes are negative. There is a separate spherical tumor the size of a peach with a

smooth deep red surface. On section it contains two chambers with clear straw-colored fluid and a solid fibrous nodule adjoining the cystic portion and measuring five centimeters in greatest diameter.

Microscopic examination of this separate nodule shows the structure of hyalin and cystic degenerate myoma. The largest intra-uterine tumor shows the structure of fibrous myoma. There is a glandular polypoid overgrowth of the endometrium.

Multiple fibromyomas.
Adenomatous hyperplasia of the endometrium.

Further History

Postoperative convalescence was slow and complicated by wound sepsis. On June 9 the patient was discharged well.

Interval history. During the first six days at home she felt well. After this, however, she began to have severe steady pain in the left lower quadrant of the abdomen, the lower left side, and in the region of the left hip. She had occasionally vomited. The pain had been relieved by morphia. During the following two days she felt ill and feverish and the discomfort in the left side continued.

Second admission, June 18, nine days after discharge. Examination showed a sick patient in considerable discomfort. Well marked left costovertebral tenderness was present with spasm and tenderness extending nearly to the groin on this side. No masses were felt. A catheter specimen of urine was found to contain some casts and a great deal of pus. The pulse varied from 78 to 120, the temperature from 100.2° to 103.6°. The respirations were normal. The blood was not recorded.

The patient was seen by a genito-urinary consultant who reported "the presence of a tender mass in the left upper quadrant which may well be the kidney".

Discussion

BY FLETCHER H. COLBY, M.D.

At the time of the patient's first admission to the hospital the symptoms and physical signs were typical of fibroids. This was proved by operation and requires no comment.

The chief interest in the case is in the condition found upon the second admission. About six weeks previously a supravaginal hysterectomy had been performed, followed by a slow convalescence and wound sepsis. After a short interval of feeling well the patient had developed severe pain in the region of the left kidney with pus in the urine. This was acute in onset and accompanied by a good deal of general reaction with signs of sepsis. Obviously one of the first things to be ruled out was sepsis in the wound or in the pelvis as a result of the operation. The wound appeared normal and there was no tenderness or mass in the pelvis. The presence of pus in the urine, general febrile reaction, and the palpable mass in the region of the left kidney were sufficient evidence against the urinary tract as a cause to require cystoscopy and further information about the kidneys.

Further History

Cystoscopic examination was done June 19. The cystoscope was easily passed to a bladder which appeared normal. The ureters were catheterized without difficulty. On the left side, however, the catheter would pass only about two-thirds of the way to the kidney pelvis. No urine was obtained from the left ureter. On the right side a good flow of clear urine was obtained. The function of the right kidney was normal, 18 per cent. No urine specimen could be obtained from the left side.

X-ray examination without injection showed both kidney outlines obscured by gas. There were no shadows which could be interpreted as stones.

Further Discussion

Cystoscopic examination had revealed the presence of a normal bladder with a well functioning right kidney and an uninfected urine on this side. No urine was obtained from the left kidney, and the catheter could not be passed to the left renal pelvis. This means one of several things; first that the catheter had become caught in a fold of the ureteral mucosa, as not uncommonly occurs during a cystoscopic examination. A second possibility was that the ureter was obstructed mechanically by a stone or a tie from the previous operation, or severe inflammatory changes. A pyelogram with injection of the renal pelvis with a solution opaque to the X-ray would have been of considerable help in this case, but it was felt that the patient was in too critical a condition for this procedure and furthermore that operation was imperative. The presence of a tie accidentally placed on the ureter in the course of the previous operation seemed unlikely because of the long interval without renal symptoms since the hysterectomy and because the possible obstruction was in the upper third of the ureter. The presence of a large tender mass in the region of the right kidney, pus in the urine, septic temperature and general reaction made an acute pyonephrosis the best possibility. What underlying cause could exist for this could only be speculated upon. Such might be an aberrant vessel with hydronephrosis or some other congenital abnormality which with the lowering of general resistance following operation had resulted in infection.

Further History

June 22 operation was done.

PRE-OPERATIVE DIAGNOSIS

Left pyonephrosis.
Obstructed ureter.

OPERATION, SECOND ADMISSION

Ethylene. The kidney was exposed by an incison parallel to the lower border of the last rib. The muscles were cut through and the perirenal fat identified. The kidney was exposed and was found to be enlarged to three or four times its normal size. Externally, the organ was bluish-gray in color and numerous small clear cysts could be seen projecting through the capsule. There were a moderate number of inflammatory adhesions surrounding the whole kidney. These were stripped away without much difficulty. At the lower pole an aberrant vessel, a vein, about 1 centimeter in diameter was present. This was clamped and tied. The ureter was identified and was found to be moderately thickened. This was clamped and ligated. The kidney freed from its bed fairly easily. A large pedicle clamp was put on the pedicle and the pedicle cut. The renal vessels were individually ligated, and a Number 3 continuous catgut tie put around the large vessels. There was no bleeding after tying the pedicle. The incision was closed in layers, leaving a rubber drain to the kidney bed.

The patient's condition was only moderately good at the end of the operation and 10 per cent glucose solution was given intravenously. Her condition rapidly improved after leaving the operating room.

PATHOLOGICAL REPORT, SECOND ADMISSION

A congenital cystic kidney 22 centimeters long by 8 centimeters wide containing numerous cysts of varying size containing clear watery fluid.

Microscopic examination shows a diffuse inflammatory cell infiltration of the parenchyma. There is a small rim of normal kidney tissue to be seen.

Congenital cystic kidney.
Pyonephrosis.

FURTHER HISTORY

The patient felt well after the operation, and made a good convalescence. July 9 she was discharged improved.

FURTHER DISCUSSION

The presence of congenital cystic kidney or, as the condition is more commonly termed, polycystic kidney, was unsuspected before operation. In reviewing the facts of the case it is difficult to see how this diagnosis could have been reached. Polycystic kidneys are not common, occurring according to one author in sixteen of about ten thousand autopsies. The condition is usually if not always bilateral and is one of the congenital malformations of the kidney for the cause of which there have been many theories. Usually there are no symptoms for many years. The commonest symptom of the disease is pain from the pressure of the enlarging mass. Hematuria in small degree is often present, and signs of failing renal function as the condition progresses. Most of the cases die after varying intervals from uremia. Sepsis in such kidneys is an uncommon feature, being present in 2 per cent of a reported series of ninety-eight cases. In this case infection was the cause of the symptoms which brought the patient to the hospital for the second admission. Pyelography would probably have enabled us to make the correct diagnosis, since the radiographic appearance of the injected kidney pelvis gives a very characteristic picture in polycystic disease.

Operation on such cases is attended by considerable risk, varying probably with the extent of the damage to the other kidney. In this instance a well functioning right kidney contributed to the success of the operation. This patient has been seen six months after the last operation. At this time the remaining kidney was found to be enlarged so as to fill most of the right side of the abdomen. The urine was clear and contained only an occasional leukocyte and red blood corpuscle. There is moderate discomfort from the presence of this tumor, but that there is still a good deal of normally functioning kidney tissue left is evidenced by an excellent phthalein test and the absence of any of the physical signs of failing renal function.

DIAGNOSES

FIRST ADMISSION

Multiple fibromyomas of the uterus.
Adenomatous hypertrophy of endometrium.

SECOND ADMISSION

Pyonephrosis.
Congenital cystic kidney, infected.
Obstructed ureter.

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UNDULANT FEVER AND TYPHUS FEVER

THERE is, after all, something new under the sun or at least some old things under new suns. In this issue of the JOURNAL Blumer reports the presence of undulant fever and typhus fever in Connecticut, and describes the symptoms by which cases of these diseases may be recognized.

Undulant fever, originally known as Malta fever, was formerly supposed to be confined to the Mediterranean countries and to be caused solely by the drinking of milk of goats infected with Bacillus melitensis. It has developed, however, that bacilli of the abortus type, commonly infecting kine and swine, and close biologic relations of the bacillus of Malta fever, are prevalent in this country and are capable of producing in man a disease similar to the Mediterranean fever—a disease of a serious nature. Bacteriologic and serologic studies have shown that abortus infections in dairy cattle and in swine are widely disseminated in the United States, in some of the states fifty per cent. of the herds being affected. We now know that the disease can be contracted by human beings both by contact with animals infected with Bacillus abortus or from milk of infected cows.

In Denmark where this bovine infection is widespread, cases of undulant fever are not infrequent. Christensen has reported that ten per cent. of blood samples submitted to the State Laboratory for test for typhoid and paratyphoid fever, give strong and specific agglutination for Bacillus abortus, while clinical investigation of such serologic cases shows them to be actual cases of undulant fever. With the infection now so prevalent and possibly spreading we may expect more and more cases of this disease. Doctor Blumer's paper, therefore, should cause physicians to be on the watch for cases of this kind and should be of great help in establishing a diagnosis.

Typhus fever, too, we have usually looked upon as a disease that prevailed or raged in foreign lands, but which had spared our country. Brill was the first to discover its presence in New York, but its identity with typhus fever was not established until later. As Blumer points out, it does occur in New England. In one of the recent Public Health Reports, Maxcy describes the distribution of endemic typhus in the United States and lists over a thousand cases of this disease (classified either as Brill's disease or typhus fever) as having been reported either in the literature or to the Surgeon General of the Public Health Service. These cases occurred in California, Connecticut, District of Columbia, Illinois, Indiana, Maryland, Massachusetts, Michigan, Missouri, New Jersey, New York, North Carolina, Oklahoma, South Carolina, Tennessee and Texas. Its distribution, therefore, is a wide one. Still other reports from Georgia, Florida, Virginia and Alabama show the disease to have been endemic in those states since 1922. With the certainty of the presence of these two diseases in New England, with such descriptions as Blumer gives of the symptomatology and course of the disease and with the laboratory diagnostic aids afforded by the State Department of Health, it should be possible to recognize these two diseases and to separate them from the list of fevers of unknown etiology.

SHALL ULTRA-VIOLET RAYS BE GENERALLY USED TO COMPLEMENT WINTER SUNSHINE?

RECENTLY a physician called this office and asked whether a certain institution engaged in using various forms of physiotherapy is reputable and explained that a person was considering sending a group of students to be subjected to violet rays for the purpose of supplying the winter deficiency of sunlight. There was no question of specific evidence of the need of ultra-violet rays in the ensuing conversation, but the question was asked why not use violet-rays if prolonged exposure to the summer sun at bathing resorts is beneficial.

Now comes the report of the warning in the report given out by the New York Academy of Medicine published in the *New York Times* of January 9, 1929, based on the statement that "experimental confirmation of the well-known fact that cancer of the skin is more frequent among those exposed to excessive sunlight" a warning is issued as a part of the statement of three important steps made in the study of cancer; the first and second relating to the behavior of cells under certain conditions and the third, which is endorsed by some physicians, to the effect that in certain cases "ultra-violet rays increase rather than retard the effectiveness of the agent producing cancer."

We are of the opinion that apparently healthy children should not be subjected to artificial ultra-violet rays and that this form of therapy should be under the control of competent physicians. We are in an age when all new therapeutic resources are overemphasized in the newspapers. We know that the valuable properties of electricity have been perverted to unwise uses. Enthusiasts as well as quacks have been guilty of playing to the imagination of the laity in many fields in the improper use of many therapeutic agents. Ultra-violet rays have become popular with some doctors and are especially alluring to the laity. Here as in many other departments of medicine a little knowledge may be dangerous. We appeal to the profession to urge the laity to refrain from using ultra-violet rays unless advised and controlled by physicians. Good ventilation and active exercise out of doors will, even in the winter, make the use of artificial ultra-violet rays unnecessary in the great majority of young people who are without evidence of certain definite diseases.

GRADUATE COURSE IN CANCER

LAST Spring, the Cancer Committee of the Philadelphia County Medical Society gave a special study course in cancer. The program consisted of lectures and clinical demonstrations at the various hospitals. Among the subjects covered were pre-cancerous lesions, early diagnosis, operative technique, radiation, lead treatment, heredity and diet. The course lasted for three days and had an enrollment of 135 physicians, many of them being general practitioners.

Should not a similar study course be undertaken by the Massachusetts Medical Society? The general practitioner is being asked to diagnose cancer at an earlier stage of the disease than ever before and it is extremely probable that the interval between first symptoms and the consultation with the physician will still further be shortened. The vast amount of publicity being given to cancer is causing many to frequent the doctor's office, about a seventh of whom are found to have cancer. During the cancer campaign last spring it was estimated that twelve thousand persons consulted physicians. It is difficult to diagnose an early cancer but it is more difficult to determine definitely that a patient does not have the disease, yet we of the profession are constantly being asked to do this. Would not the instigation of a short study course in cancer similar to the one held in Philadelphia be a worth while move on the part of our Society?

THIS WEEK'S ISSUE

CONTAINS articles by the following named authors:

BLUMER, GEORGE. Honorary M.A. M.D. Cooper Medical College, San Francisco, 1921. David P. Smith Clinical Professor of Medicine, Yale University. His subject is: "The Occurrence of Undulant Fever and Typhus Fever in Connecticut." Page 215. Address: 195 Church Street, New Haven, Connecticut.

ALLEN, ARTHUR W. A.B., M.D. Johns Hopkins Medical School, 1913. F.A.C.S. Assistant Visiting Surgeon, Massachusetts General Hospital. Instructor in Surgery, Harvard Medical School. Address: 264 Beacon Street, Boston. Associated with him is:

SMITHWICK, REGINALD H. B.S., M.D. Harvard Medical School, 1925. Assistant Surgeon, Out-Patient Department, 1929. Alumni Assistant in Surgery, Harvard Medical School, 1927-1928. Their subject is: "Thrombosis of Peripheral Arteries Following the Intravenous Injection of Typhoid Vaccine—Report of Two Cases." Page 217. Address: 264 Beacon Street, Boston, Massachusetts.

BURLEY, BENJAMIN T. A.B., M.D. Harvard, 1901. Visiting Neurologist to Worcester City Hospital and The Memorial Hospital, Worcester, Mass. Consulting Neurologist to Holden, Louis Pasteur and Worcester State Hospitals. His subject is: "Spinal Cord Decompression: Indications and Results." Page 219. Address: 19 High Street, Worcester, Massachusetts.

VAN BREEMAN, J. M.D. Director of the Physio-Therapy Institute, Amsterdam. Secretary of the International Committee on Rheumatism. His subject is: "On the Importance of Clinico-Physiological Research in the Diagnosis and Therapy of Chronic Rheumatism." Page 225. Address: Amsterdam, Holland.

SHATTUCK, GEORGE C. M.D. Harvard, 1905. Assistant Professor of Tropical Medicine, Harvard. Junior Visiting Physician in Charge of the Service for Tropical Diseases, Boston City Hospital. His subject is: "Surgical Aspects of a Few Tropical Diseases." Page 229. Address: 520 Commonwealth Avenue, Boston, Massachusetts.

PARKINS, LEROY E. A.B., M.D. Harvard, 1918. Assistant in Diseases of Chest, Medical School, Boston University. Examiner, Boston Health

Department, Division of Tuberculosis. His subject is: "Unusually Large Thyroid Dosage. Its Dangers: Case Report." Page 231. Address: 12 Bay State Road, Boston, Massachusetts.

FRIED, B. M. M.D. Saratow University Medical School (Saratow, Russia). Formerly assistant to Professor Besredka, Pasteur Institute, Paris, France, and to Professor S. B. Wolbach, Harvard Medical School and the Peter Bent Brigham Hospital. Graduate Assistant in the service of Professor Harvey Cushing, Peter Bent Brigham Hospital. Assistant in Medicine, Beth Israel Hospital, Boston. His subject is: "Hilum Tuberculosis in an Old Man." Page 233. Address: 638 Beacon Street, Boston, Massachusetts.

TOBEY, JAMES A. B.S., LL.B., M.S., Dr.P.H. Massachusetts Institute of Technology, 1916 and 1927. Director of Health Service, The Borden Company, New York. His subject is: "Powdered Milk and the Public Health." Page 237. Address: 350 Madison Avenue, New York, New York.

The Massachusetts Medical Society

STATED MEETING OF THE COUNCIL

A STATED meeting of the Council will be held in John Ware Hall, Boston Medical Library, 8 The Fenway, Boston, Wednesday, February 6, 1929, at 12 o'clock, noon.

Business:

1. Reading minutes of last meeting.
2. Report of Committee on Membership and Finance, on Membership.
3. Reports of committees appointed to consider petitions for restoration to the privileges of fellowship and appointment of committees to consider new petitions.
4. Appointment of three delegates to the House of Delegates, American Medical Association, for two years from June 1, 1929.
5. Appointment of delegates to the annual Congress on Medical Education, Licensure and Hospitals at Chicago, February 18, 19, 20, 1929.
6. Appointment of delegates to the annual meetings of the New England State Medical Societies.
7. Report of the Treasurer and Auditing Committee.
8. Report of Committee on Membership and Finance, on Finance, with Budget for 1929.
9. Report of Committee on Clinics and Health Associations.
10. Report of Committee to Investigate the Workmen's Compensation Act.
11. Incidental Business.

WALTER L. BURRAGE, *Secretary.*

Brookline, January 30, 1929.

THE BOSTON MEDICAL LIBRARY

NEW HEADQUARTERS FOR THE MASSACHUSETTS MEDICAL SOCIETY

THE problem of permanent quarters for the Massachusetts Medical Society has found a fortunate solution in the plan to take space in the enlarged Medical Library. The advantages of the plan are many.

Immediate access to the contents of the Library by the Editorial Staff of the NEW ENGLAND JOURNAL OF MEDICINE is made easy. In his Report of the Committee of Nine at the Council meeting last June, Dr. Homer Gage said: "Probably few persons have any realization of the complicated nature of the business and editorial details of publishing a weekly journal. In addition to the routine work of the office, much time has to be devoted to giving opinions and facts to many desiring advice or information". The advantages of easy reference to the Library are obvious.

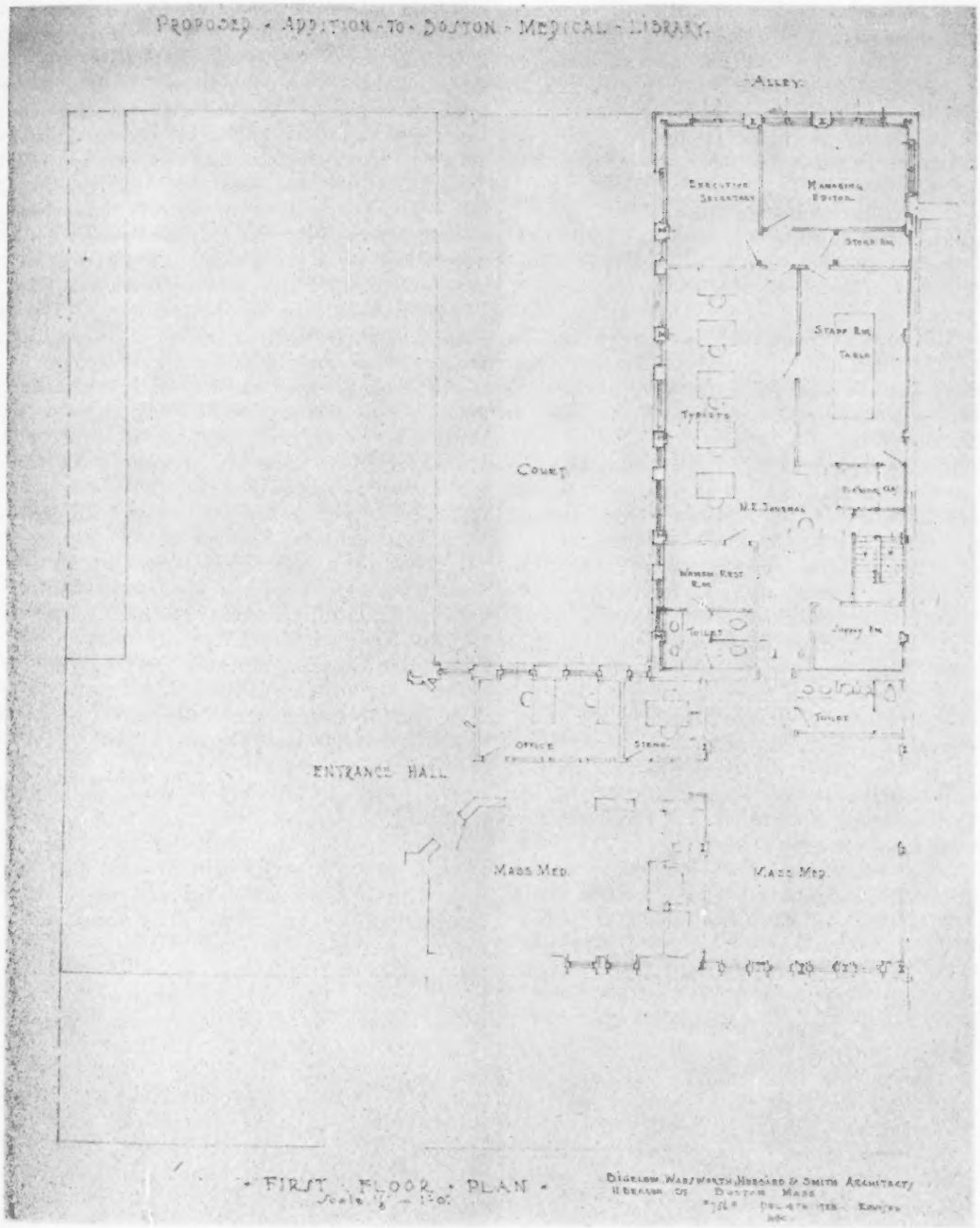
The location of the Library is exceptionally favorable. Standing in a residential neighborhood, with the Fenway Park in front and an attractive plot of open ground in the rear, it is practically undisturbed by traffic and the noise of the city. Moreover, it is in a region which President George E. Vincent, of the Rockefeller Foundation, recently declared to be "one of the most important medical centers in the world." Medical and dental schools, hospitals and health centers, numerous and varied, are near by and plans for more are under consideration. Not only local physicians, but those visiting the city, find their interests centering largely in this section.

The interior arrangements are shown on the accompanying plan. The entire first floor of the proposed addition is to be devoted to the use of Society and JOURNAL. At the front, with windows opening toward Fenway Park, will be the Executive Office of the Society. The room is 33 by 28 feet, with height of 14½ feet. Entrance will be through a corridor from the main entrance to the Library.

Adjoining this room, but in the present Library building, will be the Society's committee room, formerly known as the "supper room." This also fronts on the Fenway, and with its fireplace and mantel it will be, when re-decorated and re-furnished, an attractive and commodious board room.

In the rear of the Executive Office and directly connecting, will be the editorial offices of the NEW ENGLAND JOURNAL OF MEDICINE. The entire space is 64 x 28 feet, with a height of 15 feet. This will be divided to suit the editorial staff. The present plans call for offices for the Managing Editor and Executive Secretary at the rear of the building, both with excellent natural light. A staff consultation room and ample space for clerical workers are provided.

Also available to the Society will be the large new dining hall in the basement of the present


PROPOSED ADDITION TO BOSTON MEDICAL LIBRARY.
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OFFICE
STENO.
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building. This will occupy the space now used as a receiving room for the Library. An adjacent store-room is to be converted into a kitchen and the equipment will make possible the service of a large company at table. Both these rooms have good windows fronting in the yard, or passage-way.

All the above rooms are appropriate for dedication as memorials to distinguished members of the Society. No place could be more suitable for the commemoration of men who, in addition to their service to their own patients, have been leaders and creators of the combined efforts of the profession to enlarge and improve its public usefulness.

The financial arrangements in connection with these plans provide for the allocation of $100,000 out of the campaign receipts, to the Medical Society. This Fund will be held as an endowment. Such part of the income as is needed will be paid to the Library as rent, for the proportionate share of maintenance and care of the building. If at any time a change is decided upon, this sum will be available as capital to be applied to the securing of other quarters.

The coming together of the Society and Library under one roof will, it is expected, be the first step towards a much more inclusive medical center. Space will be available for executive offices of other kindred organizations. Dentists, nurses, public health and preventive medicine groups have many interests in common and touch each other at innumerable points. Located in a single building, conference and unified action will be promoted, and their influence founded upon the problems of public health in which all are interested. With its amended charter, the Library is committed to the promotion of this purpose, a purpose in which its officers are heartily interested, and which will have effect of state-wide importance.

REPORT OF THE LIBRARIAN FOR THE YEAR 1928

Read at the Annual Meeting
January 15, 1929

The year just closing, from the standpoint of those specific purposes for which a Medical Library exists viz.: the collection, classification and diffusion of current medical literature, has been one during which we have been obliged to some extent to "mark time," though the appended figures show reasonable additions to our collections. However, most of the energy of everyone connected with the institution outside of routine, has been devoted to the consideration of plans for preventing a repetition of this undesirable state of affairs. I do not need to go into this for what is under way is familiar to you all and we believe will result in placing the Library again in a position where it can follow the trail which has been so successfully blazed for it by those who have, in the past, devotedly conducted it to its present position. Merely to have books and periodicals on our shelves does not indicate a "going concern" any more than it would in a mercantile house whose shelves were crowded with goods of the latest pattern and material but where no definite effort was being made to dispose of them. In these days the merchant cannot afford to wait for the public to find out what he has in stock. He must possess a sales force that can distribute his goods amongst those who need them. He has to create his own market. A somewhat similar situation confronts a Medical Library. By energetic salesmanship the merchant makes room for the new products which are pressing to crowd the older out. Doubtless as a result of the salesman's efforts some purchasers may be found who do not know they need the goods. That is just as true of the "goods" the Library carries. Many a physician would be the better equipped if energetic library salesmanship would force him to acquire what he did not know he needed. The two attempts which have been inaugurated this year to take a page out of "big business" have been the weekly or fortnightly exhibition in Holmes Hall of some of the more important literature on subjects of timely interest, notice of which has been given in advance in the New England Journal of Medicine, and the employment of a Reference Librarian in Holmes Hall who is prepared to assist members of the Library in bibliographical research. The Director will be glad to act for any member in purchasing medical books and purposes, so far as possible, to make available the Library's facilities for procuring scientific medical information of whatever sort for the benefit of its members.

The proposed changes in the classification of members, which we hope you will ratify, are designed to open the doors to the service of the Library a little wider and provide the Institution with a more active membership. It is in our plan to develop a scheme by which an extension service may be made available in centers throughout the State and possibly even beyond its borders. Enquiry has shown that considerable interest in such a suggestion exists, in certain localities. From an administrative standpoint such a plan would be very desirable, for one of the insistent problems always before us is what shall be done with books that are out of date? Is it desirable to have a periodic house cleaning to make shelf room? Just as certainly as this is done calls will come in from those who are engaged in research, for the books or periodicals of which such disposal was made. Even our Director would fail us in having the insight to avoid such a possibility. It is absolutely necessary to keep space not only to house books almost never in demand but for the innumerable duplicates which we accumulate but find of immense service, at times, for exchange purposes. Some of this material could be off our shelves

on "extension service" and yet available when called for ,because "on call."

Through the generosity of Dr. W. N. Bullard the Library has received, as a donation, his 16th and 17th century books and a considerable number of more recent ones pertaining particularly to the subject of Epilepsy. He has added during the year, about thirty volumes to the very valuable list of Incunabula in his collection. The sale of a large collection (about 900 volumes) of duplicate books on Medical History, to Chicago University, has brought our Medical History Fund now to close around the $6,000 mark. In addition to this, Dr. John Warren left a bequest of $5,000, the income from which is to be used to purchase books on Medical History, particularly on Anatomy. We have therefore here in our Library a very respectable nucleus of material of very great value to those interested in Medical History, a subject which is becoming more vital every year. More and more demand is being created for books of this sort. The Boston Medical History Club, which in its inception was the offspring of the Library, has been contributing to a broadening interest in this subject and we hope will make an even wider appeal to our membership. Still another way in which good library salesmanship may benefit us as well as those to whom the service is offered, is, in establishing a course in Medical Bibliography to be open to certain students in the medical schools and others who would profit by instruction in the best ways to avail themselves of the service of a medical library. During the year we have displayed on a bulletin board in the entrance hall the lists of operations scheduled for that day in all the large and easily accessible Hospitals in town. All Clubs and Hotels were notified that this service was available over the telephone at nine o'clock every morning except Sundays and Holidays. There has been a considerable rearrangement in Holmes Hall. A large cabinet has been brought in containing a card catalogue of pictures, photographs and various kinds of illustrations, which the Library has always kept up but never before have they been in a separate catalogue. We look forward with anticipation to the successful completion of the task set us in providing funds to increase our facilities, not merely because of greater ease or comfort which will, at least temporarily be supplied, but to the very great advantage which will accrue to the Public through the co-ördination of so many kinds of public health effort concentrated under one roof as the idea of an Academy or Health Center gradually takes shape.

It is always gratifying to witness the growth of special book funds and this year in addition to the legacy for Medical History from Dr. Warren we have received the sum of $2,000 from Mrs. William Richardson Woodbury, in memory of her husband, to be devoted to the purchase of books on Neurology.

Certain facts concerning the administration of the various departments may be of interest to you.

During the year 3,894 volumes and 2,248 pamphlets were added to the collection making a total of 149,882 volumes and 98,871 pamphlets in the Library on December 31, 1928. The rate of accessions has kept up pretty well in spite of curtailed buying because of lack of shelf space.

Library members who have entered the field of medical authorship have supplied us with presentation copies of their works. In the matter of circulation and use of books and periodicals the statistics show a gain over the previous year. During the year the attendance has been 10,778 and the use and circulation has been 28,479.

We should have liked to have been more liberal in our subscriptions to new periodical literature, the volume of which is ever on the increase but this year's list indicates the resources of the Library in this department. We take pleasure in acknowledging our gratitude to those who have generously donated their journals to us. The number of periodicals received regularly has been 668 of which 458 were subscriptions.

We have many periodical files that are lacking in completeness. Through exchange, purchase, donation, etc., our Director is constantly on the watch to complete these sets. During the year twenty-two of them have been so filled out. We regret that it is not possible here to record the notable donations which have been given by friends of the Library. These include in addition to books, dissertations, journals and photographs, an Inca phallic water vessel from Peru and a ritual slaughtering knife.

The increased usefulness of the Library to those who are not in the Boston district might be well seen were it possible to read the list of places to which inter-library loans have been made during the year. They have gone to New York, Virginia, California, Michigan, Minnesota and Ontario besides to cities in Massachusetts and throughout New England. There was a total of 58 institutions or individuals to whom loans have been made, 21 of which went outside the state. Aside from the special donations to which reference has above been made, we most gratefully acknowledge individual gifts of books, reports, pamphlets, etc., from 351 physicians, laymen, hospitals, health departments, universities, corporations, societies and various organizations.

The Library is deeply interested in the activities of the Medical History Club and during the year eight meetings were held at the Library at which fifteen papers were read by members of the Club.

It is a great pleasure for the Librarian and Director to acknowledge and commend the efficient service which has been so willingly and faithfully given by all the personnel of the Li-

brary and the more is this deserved in view of the difficulties under which they have been obliged to do their work.

CHARLES F. PAINTER, M.D.,
Librarian.

MASSACHUSETTS LEGISLATIVE NOTES

THE CHIROPRACTIC BILL

SENATE Bill 225 provides for the establishment of a board of examination and registration to regulate the practice of chiropractic.

Under the provision of the bill the board shall consist of three members. Chiropractic is defined as follows:

Section 87 F. Chiropractic or the system, method, or science commonly known as chiropractic, or the practice of chiropractic, is hereby defined to be the method, science or practice of locating and adjusting the sublimations of the articulations of the human spine and its adjacent tissues. No practitioner of chiropractic, commonly called a chiropractor, shall, unless registered as a physician or surgeon under this chapter, practice obstetrics, or administer drugs or perform surgical operations by the use of instruments or hold himself out as and for other than a chiropractor.

The educational requirements of applicants for registration are as follows: Graduation from a chiropractic college as defined in:

Section 81 L. A chiropractic school, university or college shall be considered reputable which possesses the following qualifications:—

First. It shall be incorporated and authorized by its charter to confer the degree of doctor of chiropractic;

Second. It shall give a course of at least twenty-two hundred, sixty minute, daylight hours, to matriculants possessing the educational qualifications required for graduation from a public high school;

Third. It shall confer such degree only after personal attendance of the applicant thereof at such course, and upon completion thereof.

The requirements of examination are as follows:

Section 87 L. The board shall examine each applicant as to his qualifications for the practice of chiropractic. Such examination shall be wholly or in part in writing, in the English language, shall be of a scientific and practical character, and shall include the subjects of anatomy, physiology, symptomatology, hygiene, sanitation, chemistry, histology, pathology, chiropractic analysis and the principles and practice of chiropractic as taught in reputable chiropractic schools and colleges and shall include practical demonstrations. Any applicant whom the board finds qualified to practice chiropractic shall be registered as a chiropractor by the board and shall receive a certificate of such registration signed by its chairman and secretary.

Otherwise the bill is very much like other registration bills.

This bill has been assigned to the Committee on State Administration for hearing on February 20th.

The membership of this committee is Senator Perham of Chelmsford, Chairman, and Senators Haley of Rowley, Tarbell of East Brookfield and J. P. Buckley of Boston, and Representatives Luitwieler of Newton, Estabrook of Fitchburg, Dewar of Malden, Burgess of Dedham, Duffie of Boston, Brown of Billerica, Butler of Leominster, Cahill of Braintree, Hackett of Taunton, Meehan of Lawrence and McCarthy of Cambridge.

This bill will be pushed by a very powerful lobby backed by abundant financial resources and the hearing will be attended by crowds of individuals endorsing chiropractic.

The Joint Committee on Legislation needs the aid of every registered physician if the public is to be safeguarded by laws which shall require all who practice the healing art to have adequate fundamental knowledge regardless of the methods of treatment employed.

MISCELLANY

PHYSICIANS REGISTERED BY MASSACHUSETTS BOARD OF REGISTRATION IN MEDICINE IN EXAMINATION HELD NOVEMBER 13, 14, 15, 1928; ALSO PHYSICIANS REGISTERED UNDER NATIONAL BOARD ENDORSEMENT. NATIONAL BOARD REGISTRANTS ARE INDICATED BY *

Aitken, Alexander Philip, Monson State Hospital, Palmer.

*Allman, Charles Hugh, 116 Washington Street, Boston.

Argoff, Joseph, 25 Providence Street, Worcester.

Ashkins, Joseph Isaiah, Burbank Hospital, Fitchburg.

Bauer, Walter, Massachusetts General Hospital, Boston.

Bavuso, Anthony Christiana, 27 Frederick Avenue, Medford.

Bloom, Philip, 187 Bryant Street, Malden.

Briggs, Henry, 27 Eliot Road, Lexington.

Bursey, Wallis Lawrence, Farmington, Maine.

Calicchio, Eli Joseph Augustus, 154 Richmond Street, Boston.

Christophe, Kenneth, Bridgeport Hospital, Bridgeport.

Colleran, John, 161 Dewey Street, Worcester.

Cottrell, Samuel Smith, Medfield State Hospital, Harding.

Drosdik, Vincent Albert, 97 Thorndike Street, East Cambridge.

Ernsteene, Arthur Carlton, Beth Israel Hospital, Brookline.

Fagan, Gerald Aloysius, Lattimer Mines, Penn.

Falcon-Lesses, Mark, 368 Longwood Avenue, Boston.

Gaudolfo, Marcello, 161 Tyler Street, Boston.

Genest, George Stevens, Vassar Hospital, Poughkeepsie, N. Y.

Golden, Sherman Elias, Beverly Hospital, Beverly.

Hoffman, Golda, 26 Upham Street, Malden.

Hogan, Joseph Norton, 17 Charles Street, Holyoke.

*Hoover, Walter Boyd, Lahey Clinic, Boston.

Jones, Edward Earl, 412 Beacon Street, Boston.

Jones, Thomas Duckett, Massachusetts General Hospital, Boston.
Kavalgian, Aram, 1017 Broadway, West Somerville.
Kiang, David Henry, 56 Tyler Street, Boston.
King, Frank Oscar, Drawer D, Taunton.
Klickstein, Maurice, 665 Salem Street, Malden.
Komisar, Paul Stanislaw, 60 Penn Avenue, Williamansett.
Konikov, William Morris, Massachusetts Homeopathic Hospital, Boston.
Lauber, Ilse, Boston State Hospital, Boston.
MacDonald, George Herbert, Springfield Hospital, Springfield.
MacPhee, William Malcolm, Taunton State Hospital, Taunton.
Messer, Samuel Irving, 251 Chambers Street, Boston.
*Munro, Jeannette, 11 East Newton Street, Boston.
Murray, Anna Margaret, Bellevue Hospital, New York City.
Nugent, John Leo, St. Elizabeth's Hospital, Brighton.
Orton, Lyman Ross, Worcester State Hospital, Worcester.
Pollis, Nicholas Lycurgus, 562 High Street, Newark, N. J.
Quealy, Emma Millett, 28 Dell Avenue, Hyde Park.
Rockett, Joseph, 520 Beacon Street, Boston.
Romeo, Salvatore, 85 Otis Street, Cambridge.
Routenberg, Walter Adolph, 10 Almont Street, Medford.
Schwartz, Theodore, Broad Street Hospital, New York City.
Shamlian, Charles Harry, Springfield Hospital, Springfield.
Shilling, Charles Wesley, Yard Dispensary, Navy Yard, Boston.
Slowick, Joseph Edmund, Springfield Hospital, Springfield.
Teta, Francis Alexander, 2042 63rd Street, Brooklyn, N. Y.
Tuttle, Lamar K., Myles Standish Hotel, Boston.
Wakeling, George Herbert, 21 Hazel Street, Brockton.
Weisman, Hyman Jacob, City Hospital, Cambridge.
Wilkinson, William Dean, 120 Hemenway Street, Boston.
Winograd, Abbott Louis, 151 Franklin Avenue, Newton.

Statistics of the Examination held November 13, 14, and 15, 1928, by the Massachusetts Board of Registration in Medicine:

	Registered and Date Grad.		Rejected and Date Grad.	
Tufts	9	1928	1	1928
Harvard	1	1926		
	2	1927		
Kirksville College of Osteopathy			2	1928
Royal University of Naples			1	1923
Massachusetts College of Osteopathy	2	1927	1	1925
	3	1928	3	1926
			2	1927
			5	1928
University of Montreal			1	1921
			1	1922
			1	1927
			1	1928
Boston University School of Medicine	1	1914	1	1927
	1	1927		
	2	1928		
Kansas City University of Physicians and Surgeons			1	1926
			1	1927
			2	1928
Boston College of Physicians and Surgeons	1	1927	1	1924
	2	1928	1	1927
Laval	1	1928	1	1927
Middlesex College of Medicine	4	1926	1	1922
	5	1927	1	1923
	1	1928	1	1924
			1	1925
			6	1926
			1	1927
A. T. Still College of Osteopathy			1	1926
Des Moines Still College of Osteopathy			2	1927
Philadelphia College of Osteopathy			1	1926
			2	1928
University of Pennsylvania	1	1923		
	1	1925		
Hunan-Yale	1	1926		
Missouri College of Medicine and Science	4	1927	4	1927
State University of Iowa	1	1925		
Dalhousie University	1	1925		
	1	1928		
Meharry Medical			1	1916
University of Michigan	1	1922		
	1	1924		
	1	1927		
University of Heidelberg	1	1918		
American School of Osteopathy	1	1904		
University of Vermont	1	1924		

THE TRAINING SCHOOL FOR ATTENDANT NURSES

The 73rd class of attendant nurses opened this week at the Household Nursing Association when twenty-two women entered the Training School for Attendant Nurses at 222 Newbury Street.

The classes of attendant nurses enter seven times each year, the next class opening on March 12. The course is one year in length and includes instruction in cooking, care of the home, food values, and hygiene. The pupils are sent to affiliating hospitals for training in bedside nursing. This hospital training is given in the following institutions: The Emerson Hospital in Concord, Concord, Mass.; Fairlawn Hospital, Worcester, Mass.; The Home Memorial Hospital, New London, Conn.; Marlborough Hospital, Marlborough, Mass.; Mary Lane Hospital, Ware, Mass.; Moore Hospital, Brockton, Mass.; Norwood Hospital, Norwood, Mass.; Winthrop Community Hospital, Winthrop, Mass.

APPOINTMENTS TO THE STAFF OF RESEARCH WORKERS UNDER THE DIRECTION OF DR. C. MACFIE CAMPBELL

Dr. Jacob Kasanin, formerly Visiting Psychiatrist of the Federated Jewish Charities of Boston, has been added to the Research staff as Research Associate. Dr. Kasanin has had an exceptional training in medicine and psychiatry and has been on the

staffs of the Boston State Hospital, Boston Psychopathic Hospital, and the Mt. Sinai Hospital of New York City.

In addition to Dr. Kasanin's appointment, we are glad to announce the addition to the staff of Dr. Ella Duff, as Research Psychiatrist and of Miss Barbara J. Ashenden, Miss Grace I. Finn-Brown, Miss H. Louise Parsons, and Miss Zitha A. Rosen, students at Simmons School of Social Work, as Fellows in Psychiatric Social Research. The research is concerned with an investigation of the social factors of the functional psychoses, which constitute about forty per cent. of the admissions to our mental hospitals. The work has been going on for about three years and has progressed so far as to deserve a further special grant of funds which enables new personnel to be added to the staff already at work.

A SUGGESTION FOR THE LEGAL CONTROL OF SOME FOODS

Dr. John P. Buckley, a Western dentist, in an address before the Chicago Dental Society suggested another amendment to the Federal Constitution which would prohibit the use of foods regarded as deleterious by dentists and physicians. This may, perhaps, be a logical sequence to the eighteenth amendment and may lead to the adoption of a legally defined diet.

TWO REPORTED SCIENTISTS COMMIT SUICIDE

Dr. Arthur Brown Smith and his twin brother, Dr. Sydney McKendrick Smith, have committed suicide in London, England.

The explanation given is contained in a note found in the apartment with the bodies which sets forth that their lives had been devoted to scientific study which had not been remunerative and that there was no expectation of being able to live in comfort.

ADDITION TO THE NEW ENGLAND BAPTIST HOSPITAL

This active hospital of one hundred and three beds has acquired the Cushing Hospital and will thereby add fifty beds to the present number. This addition will be used largely for observation and convalescent patients.

Plans for a new wing which will double the present capacity of the hospital have been drawn. A campaign for raising the funds required to erect and equip the addition will be put into operation before long. This wing will cost about $750,000.

This is one of the popular hospitals in Boston and is worthy of support.

THE OUTLOOK FOR REDUCING THE MORTALITY FROM LOBAR PNEUMONIA, TYPE I

From experiments still in process, it seems probable that lobar pneumonia, the most important of all the acute diseases, both as regards incidence and mortality, will be the next to feel the effects of the skill of the physician, the bacteriologist and the biological chemist. This conclusion follows a series of investigations set in motion by the Metropolitan Life Insurance Company through its Influenza Commission, the idea of which was conceived by Dr. Lee K. Frankel, Second Vice-President of the Company, and which was organized under his direction. The Statistical Bureau of the Company has recently analyzed the results obtained by the Pneumonia Service at Harlem Hospital in New York City, where, for the past two years the Littauer Pneumonia Fund has supported a research into the value of anti-pneumococcic sera in the treatment of lobar pneumonia. This work has been done under the general supervision of Dr. Jesse G. M. Bullowa. Since September 1, 1926, each alternate pneumonia patient admitted to the hospital was injected, as soon as possible after admission, with a polyvalent serum containing, in varying proportions, antibodies of pneumonia, Types I, II and III. Subsequent doses have been administered according to the clinical progress of the case. By the usual laboratory methods, tests were made to determine the type of organism which was involved in each individual case, after which the serum injected was the specific serum containing only antibodies of that type. Except for the use of serum, all patients were given the same medical care in respect to drugs and nursing. The serum has also been used at Bellevue Hospital, New York City.

Careful records have been kept of the subsequent histories of patients at the Harlem Hospital. The figures quoted are limited to cases of lobar pneumonia, Type I, for which, thus far, the most potent serum is available.

Up to June 1, 1928, 214 cases of this type were treated at the hospital, 109 of which were given serum treatment, and 105 standard treatment without serum. Of the serum-treated patients, 18 died, giving a case-fatality rate of 17 per 100. Of those treated without serum, 33 died, and the case-fatality for them was 31 per 100. Thus the use of serum carried with it a reduction in the case-fatality of 14 per 100 or over 40 per cent.

The table submitted shows further that the cases in which the disease organism had invaded the blood stream, and which usually terminate fatally, yielded to serum treatment. Of 28 cases of this nature which were injected with the serum, 10 died and 18 recovered, whereas of the 28 given the standard treatment, 20 died and only 8 recovered. The difference in the case-fatality of the two groups is 35 per 100 in favor of those given serum treatment, a reduction of nearly 50 per cent. in the mortality. Among the milder cases, namely, those in which the blood was negative, the group treated with serum showed a case-fatality rate of 10 per 100 as against a rate of 18 per 100 among the non-serum group. The margin is, therefore, 8 per 100 in favor of the treated group of blood negative pneumonias, a reduction of nearly 45 per cent. in the mortality.

These results have been subjected to the usual tests for validity and have been found to be statistically significant; that is, the odds are very strongly against these results being due merely to chance variations that occur between two given samples of the same kind.

Other findings indicate that the use of serum shortens appreciably the duration of the illness among those who recover. It also enables patients to put up a better fight against the disease even in cases that terminate fatally. It is generally agreed that the use of serum is more effective when given early in the course of the disease. These results in pneumonia treatment are certainly striking and

encouraging, and it is to be hoped that it will not be long before anti-pneumococcic serum is generally used by practicing physicians. The serum for the treatment of Type I lobar pneumonia is not yet available for country-wide distribution. It is expected that progress in the commercial manufacture of the substance will be sufficiently advanced in 1929 to make it generally available to physicians before the 1929-1930 pneumonia season sets in.—*Bulletin Metropolitan Life Insurance Co.*

CORRESPONDENCE

A REPLY TO THE LETTER OF DR. MAX BAFF*

Editor, NEW ENGLAND JOURNAL OF MEDICINE,

Dear Sir:

Brother Baff begins by promising an improvement of circulation if you publish his letter. Although not disclosing the modus-operandi by which his letter is to increase your circulation, kindly permit one who is "knocked" by its innuendoes to direct attention to the homely adage that—"sugar and honey will catch far more flies than vinegar and the swatter."

There are approximately a thousand graduates of so-called class "C" schools practicing in New England at this writing, and it is quite logical to assume that those who may, directly or indirectly, be supporters of this publication are not especially elated at being referred to as "fakers". Furthermore, it is conceded among men of logic that a little more conciliatory spirit might make better bait to draw stray sheep into the fold than bellowing. In fact, so far as increased circulation for your publication is concerned, this reply to Dr. Baff may prove to have more "selling" power than his derogatory epistle.

Dr. Baff wants the visiting member of the "New York State Medical Examiners to tell us a whole lot about what he *thinks* of licensing poor doctors of class 'C' schools, who would likewise have to be relicensed yearly." It is assumed that the word "relicensed," as used by Dr. Baff, refers to the proposed annual registration act. That assumption being correct, then it may be stated that, in the first place, the representative from New York evidently prefers to talk about what he *knows* rather than about what he *thinks*, concerning class "C" graduates, with whom, as a member of the New York Board, he has had no personal experience because his state never examined them since he was a member of that examining body.

Secondly, the proposed registration act deals with the registration of licensed physicians. It in no way authorizes anyone to practice—and therefore carries with it no rights or powers to "relicense" anyone, regardless from what school he has graduated. In fact, Dr. Baff's statement in this connection clearly discloses that he is ignorant of the very fundamentals of the proposed registration act. In Florida, a like act covers every practitioner practicing any branch of the healing art, and it is the only means organized medicine has to keep tabs and check on the several cults from a legal point of view—and to that extent it is an excellent piece of legislation.

*Published in THE NEW ENGLAND JOURNAL OF MEDICINE, January 10, 1929. Page 98.

Finally, while as a graduate of a so-called class "C" school, as well as a former teacher therein, the writer by no means condones the shortcomings of these institutions; he must, nevertheless, emphatically deny the all too freely implied notion that all graduates of these institutions are incompetent physicians, and seriously objects to being referred to as a "faker," either directly or by innuendo, as Dr. Baff has done, because he happens to be a graduate of such a school; unless, per chance, those making and publishing such libelous statements can prove their assertions in open court to the satisfaction of the judge and jury—an opportunity invited by that letter.

In conclusion, from the exact dozen times in which the term "I" appears in Dr. Baff's letter, the impression is created that his egotism has seriously interfered with his reasoning powers, and his bias and blind hatred of graduates of class "C" schools has apparently soured the milk of human kindness within him to the extent of living but not letting others live; nay, even to the extent of ignoring the fundamentals of his own religious belief in the Fatherhood of God and the Brotherhood of Man!

Such attitudes are fundamentally wrong and have made possible the very continuance of the evils complained about. The swatter and sour milk policies have been employed against class "C" graduates in Massachusetts since 1908—but without the desired success in preventing their propagation and multiplication. To all who harbor a blind, intolerant, and perhaps unjustified hatred against their brother physicians who happen to be graduates from class "C" medical schools, the writer implores trying a policy of sugar and honey mellowed with a little of the milk of human kindness as a remedy for the conditions complained of—and the results that can, not may, thereby be achieved will surprise the most skeptical.

Sincerely,

CARL SCHEFFEL, M.D.

P. O. Box 2812, Miami, Florida.

RECENT DEATHS

SOULE—DR. HORACE JOHN SOULE, a Fellow of the Massachusetts Medical Society, died at his home in Winthrop, January 21, 1929, after a three-days' illness with pneumonia. He was a native of Bucksport, Maine, where he was born, September 23, 1860. His medical education was at Bowdoin College Medical School where he was in the class of 1884, then at Dartmouth, receiving his M.D. in 1885. He settled in Winthrop, Mass., and joined the Massachusetts Medical Society in 1897. He is survived by his widow, who was Miss Margaret Leah Cobb and by a son and daughter.

RICE—DR. HARRY EDWIN RICE, a practitioner of Springfield and Fellow of the Massachusetts Medical Society, died of apoplexy at his home in that city, January 21, 1929, aged 68.

The son of Edwin D. and Julia Ripley Rice, he was born in New York City and was a graduate of the New York Homeopathic Medical College and Flower Hospital in 1883. He settled in Springfield the following year. He was married to Miss Lillian Stone of Hartford, Conn., and is survived by her and by a married daughter.

WORTH—Dr. Edward Philip Worth, Medical Examiner for the first district of Dukes County, died at his home in Edgartown, of influenza, after a week's illness, January 20, 1929, at the age of 58.

Dr. Worth took the degree of Ph.G. at the Massachusetts College of Pharmacy in 1895, entered Harvard Medical School and received his M.D. in 1899. He settled in Martha's Vineyard in 1902 and joined the Massachusetts Medical Society. He was married in 1903 to Miss Harriet Vincent, daughter of Mr. and Mrs. William P. Vincent, and a resident of Edgartown since childhood. Dr. Worth was a skilled diagnostician. He is survived by his widow.

KNIGHT—Dr. Charles Eugene Knight, a Fellow of the Massachusetts Medical Society since 1899, a practitioner of Rockland after 1895, died there of influenza, January 20, 1929, aged 74. He was born in Livermore, Maine, April 20, 1854, was graduated from Bowdoin College Medical School in the class of 1879 and settled in his native town. After practising in Livermore and Livermore Falls for 16 years he moved to Rockland, Massachusetts.

NEWS ITEM

BETH ISRAEL HOSPITAL—Graduation exercises of the school of nursing of the Beth Israel Hospital were held at the community house of the Temple Israel, Longwood Avenue and Riverway, January 14. About 500 persons attended.

L. E. Kirstein presided at the exercises. The invocation was given by Rabbi Harry Levi, and the speakers were A. C. Ratshesky, Dr. C. F. Wilinsky and Miss J. A. Mulville. A. A. Ginzberg presented the diplomas. The presentation of school pins was made by Mrs. Jennie Loitman Barron and the awarding of the Fanny Kaufmann medal was made by Mrs. L. E. Kirstein. Ida Nannis was the winner of the Kaufmann medal. There were 21 graduates. A reception and dancing followed the exercises.

NOTICES

A CIRCULAR SENT TO MEMBERS OF THE LEGISLATURE IN THE REGION COVERED BY THE ESSEX NORTH DISTRICT MEDICAL SOCIETY

January 15, 1929.

By unanimous vote of this Society, which is the physicians' organization in the north half of Essex County, you are asked respectfully, to support the Washburn bill for the extension of the present vaccination law, to children attending private schools.

This is simply a public health measure.

Yours truly,

J. Forrest Burnham, M.D., *Secretary.*

567 Haverhill Street, Lawrence, Mass.

A WRONG ADDRESS

In the official notice of the revocation of the registration of Amedee P. Lamoureaux we were informed that he practiced in Chicopee. We have been notified that he practiced in Shelburne Falls.

REMOVAL

Dr. Samuel Charles Zundell announces the removal of his office to 35 Washington Street, Grove Hall, Roxbury, Massachusetts.

A NEW ENGLAND TOWN WILL SUBSIDIZE A DOCTOR

The town of Freedom, New Hampshire, will pay $1000 for one year to a competent physician who will settle there.

UNITED STATES CIVIL SERVICE EXAMINATION

The United States Civil Service Commission announces the following open competitive examination:

PHYSIOTHERAPY ASSISTANT

Applications for physiotherapy assistant must be on file with the Civil Service Commission at Washington, D. C., not later than May 7.

The examination is to fill vacancies in hospitals of the Veterans' Bureau and the Public Health Service.

Full information may be obtained from the United States Civil Service Commission, Washington, D. C., or the secretary of the United States Civil Service Board of Examiners at the post office or customhouse in any city.

REPORTS AND NOTICES OF MEETINGS

BOSTON MEDICAL HISTORY CLUB

The regular monthly meeting of the Club was held at the Boston Medical Library on Monday evening December 17th.

The first paper of the evening was read by Dr. Frederic T. Lewis, who took for his subject, "Marcello Malpighi," in honor of his three hundredth natal anniversary. Dr. Lewis illustrated his paper with many interesting stereopticon slides.

Malpighi made medicine his calling but although he practiced continuously his major interest in life was biology. "He widened knowledge through a succession of penetrating discoveries, made with the microscope". He patiently suffered a long illness and died honored by scholars everywhere.

Dr. Lewis in commenting on Malpighi's work said that "He was occupied primarily with visible forms and their significance in contrast with functional activity and its physico-chemical explanation".

At Pisa, Malpighi and Borelli worked profitably together but there arose a question of priority regarding the spiral course of muscle fibres in the adult heart. In 1861 in a letter to Borelli he described the vesicular nature of the lung and showed how the division of the wind-pipe ended in the dilated air vesicles; thus supplying for the first time an anatomical basis for the true conception of the respiratory process. Harvey had already demonstrated the circulation of the blood without knowing how the passage from arteries to veins was affected. Malpighi in a second letter to Borelli describes what appeared to be a network made up of the continuation of the artery and vein. This was the first observation of the capillaries but Malpighi could not draw them. Leeuwenhoek independently observed the capillaries in more favorable tissue and with better microscopes of his own construction and was thus able to provide pictures of unsurpassed excellence.

After his brilliant work on the lungs Malpighi made clear the division of the kidney into cortex and medulla and described the pyramids of the medulla

which to this day are known by his name. He also saw in the outer part of the real substance, the renal corpuscles. With Malpighi the kidney begins to be understood for the first time.

Wepfer in 1664 showed that the liver of the pig when boiled broke up into lobules. Two years later Malpighi published his comprehensive study of the liver in many animals, showing it to be a ductlar gland for secreting bile, and composed in man, of many sided lobules which are appended to the ends of vessels. It may be noted that Malpighi's observations are of larger structure than those seen by van Leeuwenhoek. The latter's microscopes were probably better. Where Malpighi discovered renal corpuscles and pulmonary alveoli Leeuwenhoek dealt with bacteria and spermatozoa.

In Malpighi's time discoveries in anatomy never passed unnoticed. Immediately they were subjected to criticism and Malpighi took too seriously what after all, was evidence of interest in his work. His ideas led to differences with Borelli, Kerchring and others.

Malpighi took a great satisfaction in exploring the anatomy of the silk-worm. Small tubules emptying into the intestines are known as Malpighian tubules. In embryology he made incomparable progress with his studies of the child. Equally brilliant was his study of the anatomy of plants. Malpighi's name is also associated with fundamental parts of the skin and of the spleen and with his contributions to the anatomy of the lungs, liver and kidney, there is no pioneer work in histology that can compare with his.

Dr. Harvey Cushing discussed the subject at length.

The second paper was presented by Mr. W. H. Reynolds of the Harvard Graduate School who made a very interesting analysis of "The Purple Island" by Phineas Fletcher. "The Purple Island" is an early seventeenth century allegorical poem which in part describes the human body, its organs and their offices. It was written by the Reverend Phineas Fletcher who was a worthy country parson belonging to a famous learned and literary family of the Elizabethan period. "The Purple Island" was first published in 1633 and was immediately accepted as a literary masterpiece. The poem is divided into twelve cantos, consisting of nearly seven hundred modified Spencerian stanzas, four only being of medical interest. In the first canto Fletcher, in order to give the proper religious tone as a beginning to his work goes back to Genesis for the story of the little purple island of man and its creation by the Almighty. In the second canto Fletcher commences with the epidermis and proceeds to dissect the human body in rhyme and meter. In the second and third cantos he describes the lower realm of the island ruled by King Liver, in canto four the region ruled by the heart, and in canto five, the head, where the brain is king. With this canto the anatomical portion of the poem ends, the remainder of the poem describes elaborately a battle fought between human virtues and human vices. As usual right finally triumphs.

Fletcher found it necessary to append to the medical portion of the poem a gloss containing strictly anatomical information. A study of the medical books of the Elizabethan period reveals the interesting fact that Fletcher undoubtedly used and had access to certain anatomical books of the period.

Discussion by Dr. Lund, who mentioned particularly Plato's "Timaeus" as it appeared in poetry and referred at length to the literature of Greek philosophy and anatomy.

HARVARD MEDICAL SCHOOL NEWS

On Thursday afternoon, January 10, 1929, in Amphitheatre E of the Harvard Medical School, under the auspices of the Phillips Brooks Association, Dr. Hans Zinsser, Professor of Bacteriology and Immunology, spoke on "Influenza".

Dr. Zinsser began his lecture by emphasizing the fact that nothing definitely new had been discovered about influenza, since the last epidemic in 1918. Nothing positive has resulted from newer studies of the etiology of the disease, which is still uncertain, but there has been more doubt since the last epidemic concerning the etiological significance of the Pfeiffer bacillus, which had been more generally accepted after the 1889 epidemic; and new suggestions as to filterable virus and organisms like the Bacillus pneumosintes were now under discussion. There has been no explanation of the periodicity of the epidemics, nor any satisfactory understanding of the three of four minor cycles which occur during pandemics. There is no specific preventive method and no successful manner of active immunization, nor of serum therapy.

The history of the disease goes back many years, and pandemics—quite authentic—have been described since the 16th century. Most of the older pandemics have definitely travelled from east to west and this had given rise to the idea that there might be an endemic focus in Eastern Siberia, China or Asia Minor. The modern history of influenza dates back to the epidemic of 1889. This probably began in 1888, when an outbreak of an obscure fever in Constantinople, regarded as Dengue fever, may probably be regarded as a forerunner of the epidemic. It spread both east and west, reaching England in the winter of 1889-1890, crossing to and spreading over the American continent, and meeting the eastward travelling wave on the Pacific coast. Travel was less rapid and extensive before 1889 and the epidemic travelled with the speed of human communication from place to place. Secondary and tertiary waves continued until 1892. The idea that epidemics still come from east to west, even if true formerly, is probably no longer true, Frost particularly believing that there are many influenza foci and that the last epidemic began in a number of different places during the same approximate period. Until the last epidemic, the most thoroughly studied one was that of 1889, which has been carefully described in all its phases by Lichtenstern in an influenza volume of Nothnagel. Lichtenstern characterized influenza epidemics by the following points: (1) They occur in true pandemic waves, the first wave being a sudden mass infection with a very high morbidity and a low mortality. (2) They travel with great speed, corresponding to human communication, and an epidemic burns itself out rapidly, within four to six weeks in any locality. (3) An influenza epidemic is independent of season and weather and attacks all ages and sexes.

The mild character of the disease is a quality only of the first wave. The second and third waves which succeed, according to Brownlee and others, in approximate intervals of 33 weeks, are more

irregular in the scattering of cases, last longer before burning themselves out, and are characterized by a high mortality, due to secondary respiratory infection.

There are several difficulties in studying the disease. First, it is hard to make the diagnosis, since anything from a cold in the head to a fatal pneumonia has been called influenza, and there is some difference of opinion as to what influenza really is. It is probable that uncomplicated influenza is a very mild disease, with very slight or no respiratory symptoms, very sudden onset, somatic pains, headache and great prostration, and a short-lived fever which comes back to normal in three or four days, leaving the patient very much used up. It has the property of lowering the resistance and rendering the patient abnormally liable to respiratory infection. People probably do not die from uncomplicated influenza, but die of secondary pneumonias.

The second difficulty in studying the disease is that is cannot be transmitted with clinical characteristics to animals.

Finally, indirect evidence from vaccination and serological investigation is worthless at the present time.

The etiology of the disease is still doubtful. Some assert that it is a filterable virus, but Dr. Zinsser questions any conclusions based on available filtration experiments because of the great difficulties of this type of experimentation and the many contradictions in the literature. Claims for the Bacillus pneumosintes are still more questionable, and Dr. Zinsser believes that they are nothing more than an interesting possibility. He himself is very much inclined to regard the Pfeiffer bacillus, though still uncertain, as the most likely cause. The reasons he gave for this point of view were that the Pfeiffer bacillus was found during the 1889 epidemic by Pfeiffer and other competent bacteriologists in almost 100% of the cases, and in many cases was found deep in the lungs at autopsy. Several laboratory accidents with pure cultures have added some likelihood to this view. The main arguments against the importance of this bacillus are that it is found in interepidemic periods in many conditions surely not influenza, such as bronchial pneumonias in children,—primary or following whooping cough, measles, etc.,—invariably in whooping cough, often in sinuses, bronchiectactic cavities and tuberculous cavities. Dr. Zinsser believes that this is not conclusively against the Pfeiffer bacillus theory, because one of the important experimental observations that every bacteriologist makes with the influenza bacillus is the rapidity with which it loses its virulence under the hands of the bacteriologist. No control of the virulence such as that which we have with pneumococcus is possible with the influenza bacillus, and the above argument is no more valid here than if we claimed that the pneumococcus could not cause pneumonia because it is habitually found in normal mouths. Morever, the great toxicity of broth filtrates of recently isolated influenza bacilli, discovered by J. T. Parker, lends additional probability to the idea that the disease may be a lodgement of the organism in the upper respiratory tract with a profound toxemia. The Pfeiffer bacillus cannot be thrown out until virulence and toxicity of the organism and the reasons for its fluctuations have been more thoroughly understood.

The negative transmission experiments of McCoy, Rosenau and others during the last epidemic seem to indicate to Dr. Zinsser only that, as in measles, infectiousness in this disease is limited to the very early stages. Pure culture inoculations have been almost entirely negative, except for some suggested ones by Cecil, and this may be due again to the inability to maintain the virulence of the cultures.

For lack of time, Dr. Zinsser could not go into the more technical bacteriological problems, but in summary he concluded that no typical wave had yet reached Boston. He stated that there is no specific prophylaxis and no vaccines have been proved to be of any use. Prevention must be a matter of personal hygiene, general care of the health and of the precautions one takes to avoid catching cold, and during an epidemic wave avoidance of crowds in theatres, public conveyances, etc. In hospitals it is of the greatest importance that uncomplicated cases be protected from possible respiratory infection from doctors, nurses and other patients. The first principle is not to put complicated and uncomplicated cases into the same wards. It is far better not to institutionalize cases, but if they can be kept warm and in bed—even without extensive care—they should be left alone and not moved. Treatment is purely symptomatic, the most important part of it being quiet, warmth and protection from secondary infection.

The meeting was well attended, and in view of the wide spread incidence of the disease, the topic provoked much interest.

PLYMOUTH COUNTY

The Plymouth County Medical Society met at the Brockton Hospital, Thursday, Jan. 17, 1929 at 11 A. M. They were received by Dr. Frederick M. Hollister, superintendent of the Brockton Hospital, assisted by the staff of physicians connected with the Hospital. They were entertained in a very cordial manner, Dr. Hollister proving a very excellent host.

The meeting was opened by Dr. Thomas H. McCarthy, president of the Society, who welcomed the members of the meeting with a very brief speech and then introduced Dr. Michael F. Fallon, Surgeon-in-Chief, St. Vincent's Hospital, Worcester, Mass., who spoke on "Endometrial Implant in the Umbilicus with Menstrual Reaction" with illustrative cases. In the course of his remarks, he said that he was very sure that Dr. S. W. Goddard of the Goddard Hospital was the first surgeon around this section to report a case. His address was very interesting and instructive.

Dr. McCarthy then introduced Dr. Edward J. Denning, Physician-in-Chief of the Carney Hospital, Boston, Mass., who spoke on the subject "Influenza". Dr. Denning, in his address, stated that influenza is always heralded as a new disease, though it has probably been known since the time of Homer. When it appeared in 1913 it was called "Spanish Influenza". As early as 1510 epidemics of this kind have been described and since this time we have record of eight world-wide epidemics, 1580, 1729-32, 1780-82, 1830-32, 1836-37, 1847-48, 1889-92, and 1918-20.

EPIDEMIC OF 1918

In the epidemic of 1918 a great change took place in the form of this disease. It proved to be the most widespread and also the most fatal of all the epidemics of influenza recorded in the history of the world.

There were more cases of pneumonia and a higher death rate, especially among young adults and pregnant women. As early as 1916 influenza was epidemic in 22 States of the union. In the spring of 1918 an epidemic broke out in the army camp at Oglethorpe, Georgia. It appeared suddenly in Boston, Sept. 1, 1918, in the first naval district (the army) pier in South Boston. Within a fortnight 2000 people were affected, and in two weeks all the cities on the Atlantic seaboard were seized with it. This outbreak in Boston may be described as the tail end of the first wave or the beginning of the second wave, which by the end of 1918 was world-wide spread. By the end of September it had spread from Maine to Virginia. By the middle of October it was general over the whole country and the maximum death rate in the United States occurred in the two weeks ending Oct. 26.

Waves always follow these epidemics. These waves all have the same characteristics. For example, the first wave is relatively mild, a large number of people are affected, it is not attended by many complications and lasts about three to six weeks. The second wave affects less people, but is more severe and lasts longer, seven to eight weeks. Less people are attacked, complications are frequent and severe, it develops more slowly by the third week, the peak is not so sharp and the period of decline is less rapid, and it lasts usually from eight to ten weeks. In these epidemics 20 to 40 per cent. of the people are affected, usually between the ages of five and forty. The incubation period is about 43 hours and the simple disease lasts from one to three days. Ninety-five per cent. of the cases of the first wave are simple influenza. They usually suffer from the following symptoms: Headaches, chilliness, fever, sudden onset, aching pains in the arms and legs, which are out of proportion to the head cold that the patient presents. The face is flushed, the eyes are injected and the throat is congested. In two to four days the fever subsides, leaving the patient very weak. Seventy to 90 per cent. of the cases of the second and third waves are also of this kind. There is another simple form which has complications; that is to say, on the third or fourth day, when the patient ought to be betting better, he gets worse, coughs more and raises a great deal of sputum. In this kind of case, the fever lasts for a few days to a week longer than usual, and chronic cough may last for weeks. With this type you may get inflammation of the sinuses and middle ear infection. Ten to 15 per cent. of the cases of this type of influenza occur in the second and third wave.

THREE TYPES OF PNEUMONIA

There are three different types of pneumonia which occur during the second and third waves and comprise about 10 to 15 per cent. of the cases. The first type starts in with pneumonia; it is rare; seen in the second wave, it is alarming and the patient dies within 24 to 48 hours. The second type is progressive. On the second to the fourth day, signs of pneumonia appear without any decline in the fever. The temperature in these cases is irregular and the pulse is slow in comparison to the temperature. The body becomes either of a lilac or heliotrope color. The sputum is variable. The third type is where the patient recovers from the simple influenza and pneumonia develops from the fourth to the 10th day after the onset. It is fair to conclude that one germ, the bacillus of influenza, is either the cause of or that it is an almost universal complicating invader, which gets a foothold in the body almost immediately upon the establishment of the original disease.

With all the investigation which has gone on since 1918 to the present time, there is only one other organism found which is deserving of any mention. Although in 1889 it was generally accepted that the germ of influenza was the Pfeiffer bacillus, it is a known fact that it has never been able, when injected into man or animal, to produce the disease, and naturally this is a strong argument against its being the cause of influenza. Intestinal influenza is characterized by nausea, vomiting and diarrhea, and is rare because of the liability of a mistaken diagnosis in these cases; it is wise to eliminate a possible appendix. Many cases diagnosed as intestinal grippe have come to operation and found to be ruptured appendices. I personally do not feel that there is such a thing as intestinal influenza or intestinal grippe. The outlook on pneumonia in influenza is bad, the death rate varying from 15 to 60 per cent. My experience has shown that T. B. patients are relatively insusceptible to influenza, and that it does not hasten the progress of the disease. The death rate in Brockton according to the United States public health reports, during the epidemic of 1918, showed the following figures: Influenza, number of cases reported 2625, deaths 389, 14.8%; pneumonia, number of cases reported 179, deaths 123, 68.7%; influenza pneumonia, number of cases reported 2804, deaths 512, 18.3%. The great difficulty of sharply defining this disease results in the great confusion which prevails in the research work during the last ten years. In fact, the diagnosis of influenza is more a surmise than a scientific conclusion. The word influenza has been used during the intervals between epidemics as a term of convenience to characterize conditions ranging in seriousness from a head cold with severe symptoms to fatal pneumonia. In short, there is no way, between epidemics, of differentiating a severe cold and relatively mild influenza. It may be that many of these patients have influenza and that they are the ones from which the flames of new epidemics are lighted up, but there is no way at the present time of being sure that this is the case. If the bacillus of influenza were not found as an agent in other lung conditions, such as whooping cough, and if it were not found as a normal inhabitant of the upper air passages of normal individuals, then it would be a simple matter to say that this disease is due to the germ discovered by Dr. Pfeiffer. An attack of influenza usually renders a person immune for three to four months, possibly one to two years. An attack in the early part of an epidemic may render a patient immune in the later part, but this is not absolute.

Vaccination — Vaccinating against influenza has failed to show any influence on the occurrence of or the death rate of influenza.

Dr. Charles Hammond of Hanover read a very beautiful eulogy on Dr. Andrew L. MacMillan, which was very well received by the society.

The meeting then adjourned and the various members of the society were escorted by members of the staff through the Barbara Keith Memorial Children's Hospital, which was donated to the hospital by Har-

old Keith, president of the Walk-Over Shoe Company, in memory of his daughter, Barbara Keith. Afterwards the members of the society were entertained by Dr. Frederick M. Hollister and staff of the Brockton Hospital at a very excellent dinner. It was a fine meeting in every way.

FRANKLIN DISTRICT MEDICAL SOCIETY

The January meeting of the Franklin District Medical Society was held at the Weldon Hotel, Greenfield, on Tuesday, the 8th. The attendance was small but enthusiastic. It was voted that the District Society approve and support the legislative bill requiring annual registration of physicians, also the bill providing for vaccination for private as well as public school pupils.

Dr. George McPherson of the Belchertown State School addressed the meeting informally on Mental Deficiency. He defined the various classes of deficients, outlined treatment and explained what results might be expected from treatment. The Society was cordially invited to visit the school.

CHARLES MOLINE, *Secretary.*

THE MASSACHUSETTS TUBERCULOSIS LEAGUE

Arrangements have been completed for the Fourteenth Mid-Winter Luncheon Meeting of the Massachusetts Tuberculosis League and its affiliated organizations. Proceedings will take place at Hotel Statler, Boston, on Monday, February 4, beginning at 1:00 o'clock. Dr. Frederick T. Lord, Acting President of the League, will preside.

The speakers will be Dr. George H. Bigelow, State Commissioner of Public Health, who will speak on "Public Health Progress in the Commonwealth," and Dr. Edward O. Otis, Honorary President of the League, who will speak on "Present Outstanding Problems in Our Field".

Invitations to certain members of the General Court have been extended in order to acquaint the legislators with the work of the League and its affiliated organizations.

Following the luncheon meeting there will be a joint meeting of the Executive Committee and Board of Directors of the League.

Both meetings will be held in the Georgian Room on the Mezzanine Floor of the Hotel Statler.

BOSTON ORTHOPEDIC CLUB

A meeting of the Boston Orthopedic Club will be held on Monday, February 11, 1929, at 8:15 p. m. in the amphitheatre of the Peter Bent Brigham Hospital —entrance on Van Dyke Street or by way of the Administrative Building.

PROGRAM

"Bony Growth and Its Relation to the Pituitary Gland" by Dr. Harvey Cushing.

"Experimental Acromegaly in the Canine" by Dr. Tracy Putnam.

R. K. GHORMLEY, *Secretary.*

NEW ENGLAND DERMATOLOGICAL SOCIETY

The regular quarterly meeting of the New England Dermatological Society will be held at the Out-Patient Department, Massachusetts General Hospital, on Wednesday, February 13, 1929, at 3.00 p. m.

ARTHUR M. GREENWOOD, *Secretary.*

SOCIETY MEETINGS

Combined Meetings of the Boston Medical Library, the Suffolk District Medical Society, the Middlesex South District Medical Society and the Norfolk District Medical Society (at Boston Medical Library at 8:15)

February 27, 1929—Medical Section. "Some Relations of Diet to Fat Formation in the Body," Dr. Lafayette B. Mendel, Yale University Medical School.

March 27, 1929—Meeting in association with Middlesex South District Medical Society. Clinical and Experimental Studies of Obstructing Jaundice and Its Complications. Dr. Waltman Walters, Mayo Clinic.

April 24, 1929—Annual meeting. Speaker, Dr. Walton Martin, New York City. Title to be announced later.

The medical profession is cordially invited to attend all these meetings.

February 4—Massachusetts Tuberculosis League. Complete notice appears elsewhere on this page.

February 6 — Massachusetts Medical Society. Stated Meeting of the Council. Complete notice appears on page 248.

February 11—Boston Orthopedic Club. Detailed notice appears elsewhere on this page.

February 13—New England Dermatological Society. Detailed notice appears on this page.

March 25, 26, 27—American Association for the Study of Goiter. Detailed notice appears on page 213, issue of January 24.

June 13—International Hospital Congress. Complete notice appears on page 212, issue of January 24.

DISTRICT MEDICAL SOCIETIES

Barnstable District Medical Society

Schedule of Meetings: February 7, 1929, May 2, 1929.

Bristol North District Medical Society

April 18, 1929—Spring meeting.

Essex North District Medical Society

May 1, 1929 (Wednesday)—Annual meeting at Lawrence, at 12:30 P. M.

May 2, 1929 (Thursday)—Censors meet at Hotel Bartlett, 95 Main Street, Haverhill, at 2 P. M. (Tel. 3430.)

Essex South District Medical Society

February 6, 1929 (Wednesday)—Council meeting, Boston.

February 13, 1929 (Wednesday)—Danvers State Hospital. Clinic at 4 P. M. Supper at 6 P. M. Speaker: Dr. Roger Lee, Boston; subject to be announced later. Discussion from the floor.

March 6, 1929 (Wednesday)—Lynn Hospital. Clinic at 5 P. M. Dinner at 7 P. M. Symposium on Pneumonia. Speakers: Dr. Reginald Fitz, Diagnosis. Dr. Fred Lord, Treatment. Dr. William H. Robie, Heart in Pneumonia. Discussion from the floor.

RALPH E. STONE, M.D., Secretary.

Franklin District Medical Society

Meetings will be held on the second Tuesday of March and May.

Hampshire District Medical Society

March 13, 1929—Address by Dr. George E. Gage, Professor of Bacteriology and Physiology at the Massachusetts State College.

Middlesex East District Medical Society

The following schedule of meetings has been arranged for the coming year:

March—Reading.
May—Melrose.

Subjects and speakers to be arranged by committees in each city or town.

Middlesex North Medical Society

The annual meeting will be held the last Wednesday in April.

Middlesex South District Medical Society

March 27, 1929—Joint meeting with the Suffolk and Norfolk Districts.

April, 1929—Annual meeting. Definite date to be announced later.

Norfolk District Medical Society

Below are the proposed meetings of the Norfolk District Medical Society for the 1928-29 Season. The schedule below will be adhered to as strictly as possible. The carrying out of the proposed plan will, of course, depend upon the acceptances of invitations extended to the speakers. Minor changes may be necessary.

February 25—Roxbury Masonic Temple. Dr. W. R. Ohler. Subject to be announced. Discussion to be opened by Dr. A. A. Hornor.

March 29 — Roxbury Masonic Temple. Subject and speakers to be announced.

May—Annual meeting program to be announced.

The Censors of the Society meet May 9, 1929, at the Roxbury Masonic Temple, Warren Street, Roxbury, at 4 P. M., for the examination of candidates.

Plymouth District Medical Society

March meeting at the Moore Hospital, Brockton, Mass., March 21st, program to be announced later.

April meeting at the Commercial Club, Brockton, April 18th, at 6 P. M. Annual Oration by Dr. Ralph C. McLeod, Orator; dinner.

Suffolk District Medical Society

March 27, 1929—Meeting in association with Middlesex South District Medical Society. "Clinical and Experimental Studies of Obstructive Jaundice and Its Complications." Dr. Waltman Walters, Mayo Clinic.

April 24, 1929—Annual meeting. Speaker, Dr. Walton Martin, New York City. Title to be announced later.

LINCOLN DAVIS, M.D., President.
ARTHUR H. CROSBIE, M.D., Secretary.

Worcester District Medical Society

February 13, 1929—Worcester State Hospital. Program to be announced.

March 13, 1929—Worcester City Hospital. Dedication of New Nurses' Home. Speaking program to be announced.

April 10, 1929—Grafton State Hospital. Program to be announced.

May 8, 1929—Annual meeting. Worcester Country Club.

Worcester North District Medical Society

Annual meeting the fourth Tuesday in April.

BOOK REVIEWS

"*Die Chirurgie*" by M. KIRSCHNER and O. NORDMANN. (Vol. 23.) Urban and Schwarzenberg, Berlin and Vienna. Contents—"The Surgery of the Joints and Bursa."

This volume is devoted to orthopaedic surgery in the system of surgery edited by Kirschner and Nordmann. It includes only disabilities of joints. Most of the congenital deformities, postural defects and disabilities of the spine are not discussed in this volume.

A. 1. Surgery of the Joints Excluding Tuberculosis, by E. Seifert

In this article the author attempts an encyclopedic discussion of all the diseases and disabilities of joints with the exclusion of tuberculosis. He discusses the anatomy and physiology of normal joints. The general examination of joints is gone into in the minutest detail mentioning such new features as endoscopy and ausculation. Endoscopy he regards as of little or no value while he believes that ausculation will become of greater use as we become more proficient in applying it to joints.

Congenital conditions about the joints such as accessory bones, synostoses, defects in ossification, are discussed at length. Traumatic disabilities are considered. In the discussion of purulent inflammation of joints, the author still feels that the commonly accepted methods introduced by Willem still need further proof of their therapeutic efficacy. The use of strong antiseptics in the joints is still advised.

The author has nothing new to offer on the chronic, non-specific infections and inflammations. He states that the so-called chronic arthritis or rheumatism, must be treated symptomatically.

The pathology found in the various conditions which the author discusses is covered very well. Nothing new is brought out in the discussion of the conservative and operative treatment of these various conditions.

The literature, as far as the German literature is concerned, is very well covered but there is no reference to any English or American work.

2. Chronic Deforming Joint Disturbances, by Ernst Stahnke

In this monograph a textbook discussion is made of all the chronic joint disabilities. A little over half of the monograph is given over to arthritis deformans. The author divides arthritis into two types: primary and secondary. He is not clear in his differentiation of these two types. One gets the impression that he means by the primary form what is commonly called in the English literature, atrophic arthritis: but he also includes osteoarthritis under primary arthritis. Secondary arthritis includes a large number of joint inflammations which come on gradually after trauma, metabolic disturbances and infections elsewhere in the body at any age. The etiology of arthritis is gone into at great length with nothing new offered. The manifestations of arthritis in the various joints are taken up in turn. The author advises conservative treatment with the conservation of function as the chief aim. He advises injections into the joints of various substances, particularly recommending a weak solution of novocaine and adrenalin. Sulphur and iodine are discussed as internal medication. He mentions that in some of the German clinics a good response has been obtained from x-ray radiation. He mentions in passing massage and Zander apparatus for motion. Operative treatment should be used only as a last resort when pain is unrelieved by other measures, resection of joints, arthroplasties and remodeling of joints, and arthrodeses. The author discusses foreign bodies in joints, mentioning those due to osteochondritis desiccans and those of purely traumatic origin. Legg-Calvé-Perthe's Disease with the other epiphyseal disturbances are fairly well discussed. The author stresses the frequency and lack of recognition of syphilitic joint inflammations, particularly congenital syphilis. The various arthropathies due to neurological disturbances are well covered. The transient joint disturbances which one finds in urticaria are discussed. A rather lengthy but most interesting discussion is made of the joint changes that one finds in alcaptonuria and ochronosis, the author having observed a number of cases that went on from stiffening and crepitation to what was apparently bony ankylosis; the small joints were involved chiefly. Joint swelling and stiffness are mentioned in such skin diseases as psoriasis, scleroderma and leprosy. The treatment for these is the treatment of the underlying skin diseases. Here, too, the small joints are most commonly involved. A short discussion is made of joint tumors both benign and malignant. The author favors the operative treatment in these.

B. Tuberculosis of Joints, by Fritz Koenig

The author discusses in general incidence and age

occurrence which apparently do not differ very much from those conditions obtaining in this country. The pathology is fairly well covered, nothing new is brought out in the symptomatology and diagnosis. Apparently in German clinics the tuberculin reaction plays a much smaller rôle in the diagnosis of joint lesions than it does in American clinics. The most importance is placed on the x-ray picture. The author warns that the prognosis in every case must be most guarded. In the treatment the author leads toward conservative treatment in practically all cases with much stress put upon sunlight and open air. The author speaks very favorably of heliotherapy. X-ray treatments given in doses of 1/10 to 1/2 of an erythema dose are used quite frequently. The author reports some favorable results particularly in cases where there was mixed infection with sinuses. Under this form of therapy a high percentage of cures is reported from Jungling's clinic. He advises it particularly in tuberculosis involving the smaller joints. Injections of formaline and iodine are still used in cases where there is a large accumulation of fluid in the joints.

The second part of this monograph is devoted to a discussion of the special symptoms and the special points in the therapy of the various joints, taking up in turn shoulder, elbow, hand, hip, knee and foot. In hip tuberculosis the author believes that healing with motion is exceedingly rare. In children from five to about sixteen, he believes that the operation of arthrodesis is probably the better method of treatment since in the cases that he has observed it had brought about quicker and sounder healing of the diseased process. In tuberculosis of the knee joint protection of the knee is advised throughout the entire growing period since otherwise a flexion deformity occurs whether operation has been performed or not. In ankle joint tuberculosis the author advises conservative treatment. He injects iodine and formalin about the ankle joint and feels that this helps control the effusion which occurs there. He reports from his own and other clinics 65% of healed cases with x-ray.

In conclusion the author states, "In retrospect one sees the necessity of long-continued treatment which, let me repeat, alone can bring about healing of tuberculosis."

C. Bursae, by Ernst Seifert

The author discusses the types of bursae, those that are congenital and those that are acquired from long-continued trauma or pressure. He discusses hygromata which arise in the course of certain vocations, particularly those that come in the prepatellar bursae and the olecranon bursa. He discusses acute purulent bursitis of hematogenous origin. Benign and malignant tumors of bursae are mentioned in passing. The chief part of the paper, however, is taken up with the discussion of chronic bursitis, of which bursitis around the shoulder joint the author considers to be by far the most important. This he calls periarthritis humero-scapularis because frequently he finds the capsule involved as well as the bursae. He believes trauma to be the cause of the trouble. For treatment he advises keeping the arm in abduction five to ten days, applying massage and heat. In older cases he advises manipulation under anesthesia. He states that in the cases in which there is a definite contraction of the muscles around the shoulder joint with the arm in abduction no treatment is of any avail. Very rarely is the subdeltoid bursa removed.

In this volume the illustrations, including several colored plates, are clear and their reproduction is unusually fine.

Text-Book of Urology for Students and Practitioners. By DANIEL N. EISENDRATH, M.D. Attending Urologist Michael Reese and Chicago Memorial Hospitals; Assistant Professor of Surgery (Genito-urinary), Rush Medical College of The University of Chicago, and HARRY C. ROLNICK, M.D. Associate Urologist Mt. Sinai Hospital; Adjunct Urologist Michael Reese Hospital; Formerly Associate in Genito-urinary Surgery, Northwestern University Medical School. (942 Pages.) Published by J. B. Lippincott Company. Price $9.00.

What with the new editions of standard text-books of urology and the first editions of new treatises on this subject, the medical profession of this country has been well supplied during the past two or three years. It would seem that there was little need for further publications of this type, but in spite of the apparently adequate supply, this new book by Eisendrath and Rolnick comes as a welcome addition.

The authors have presented their material in an original way; the outstanding facts are emphasized by being printed in heavier type, and there are many tables and diagrams which will help the student to memorize important points. The embryological and pathological aspects of genito-urinary disease are especially well brought out.

The book is remarkable for the thoroughness with which every subject is presented. It is questionable whether this virtue has not been carried almost too far, for so many facts are repeated in different chapters that the reader has at times a slight sense of confusion.

When dealing with debatable matters, such as ureteral stricture, the authors present both sides of the question very fairly. That section of the book which deals with the surgery of the genito-urinary tract is purposely not emphasized, although operative treatment is presented in a manner sufficiently adequate to inform the reader of the possibilities in this direction.

With the surgical judgments expressed by the authors the reviewer finds himself heartily in accord. On only a very few minor points did he disagree. On page 120, for example, it is stated that in reduplication of the ureter the lower orifice connects with the lower half of the renal pelvis. This statement is at variance with the generally accepted view and we doubt its correctness. On page 678, it is stated that "urotropin acts equally as well in an alkaline medium." Years ago it was shown that acidity and heat were essential factors in splitting methenarium into formaldehyde and ammonia.

In the treatment of cancer of the prostate, the value of total prostatectomy seems to the reviewer to be underemphasized, while that of radiation is given too much weight. Opinions on these points vary, of course, with the experience of the surgeon.

On the whole the book is surprisingly free from errors. It is profusely illustrated; authorities are freely quoted, and the didactic point of view is conspicuously absent. It reflects the teaching experience of its authors, as well as their familiarity with urology.